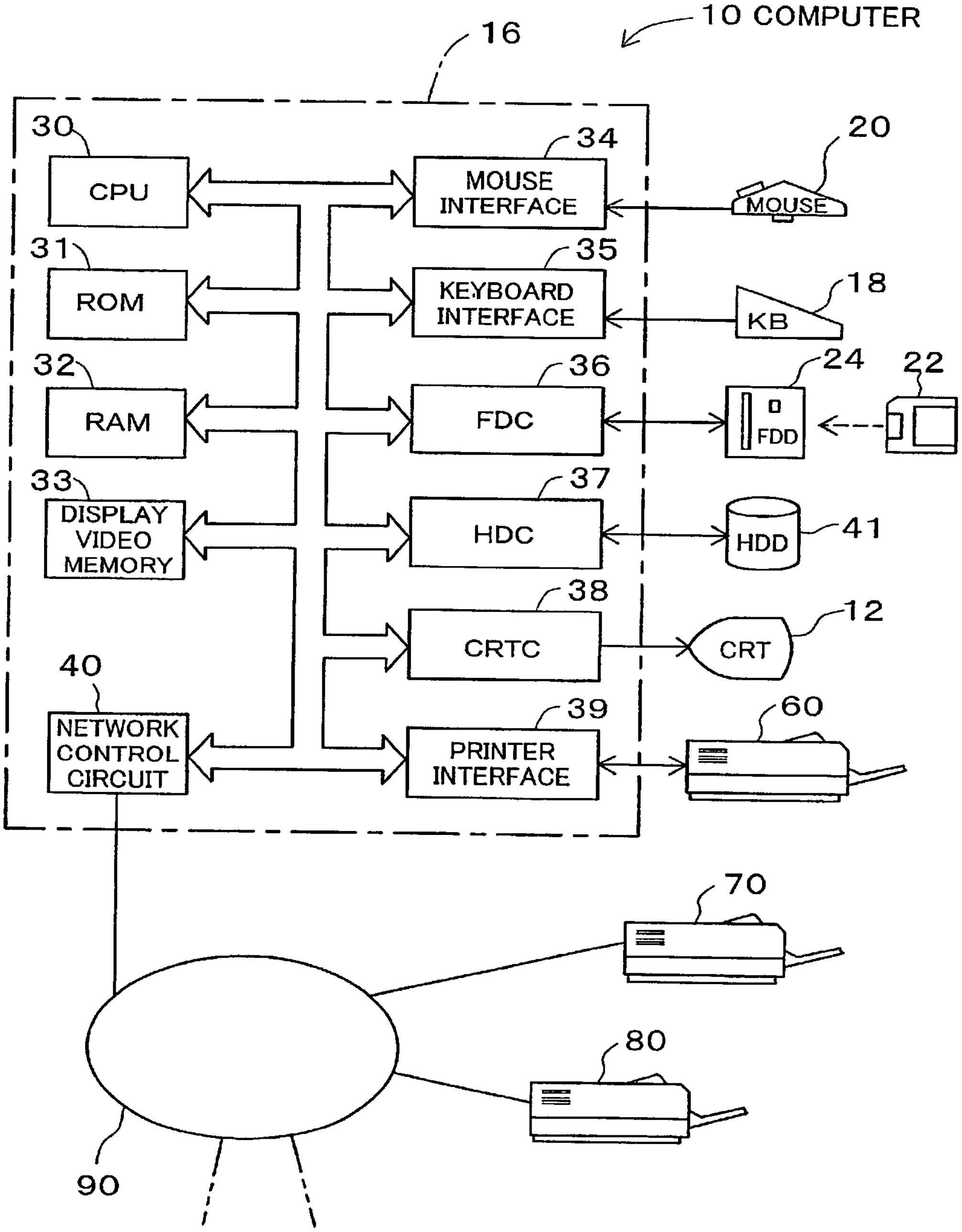
Fig. 1


10 COMPUTER
16
30
CPU
31
ROM
32
RAM
33
DISPLAY VIDEO MEMORY
40
NETWORK CONTROL CIRCUIT
34
MOUSE INTERFACE
35
KEYBOARD INTERFACE
36
FDC
37
HDC
38
CRTC
39
PRINTER INTERFACE
20
MOUSE
18
KB
24
FDD
22
HDD
41
CRT
12
60
70
80
90

09980111 .110801

09980111 .110801

Fig.2

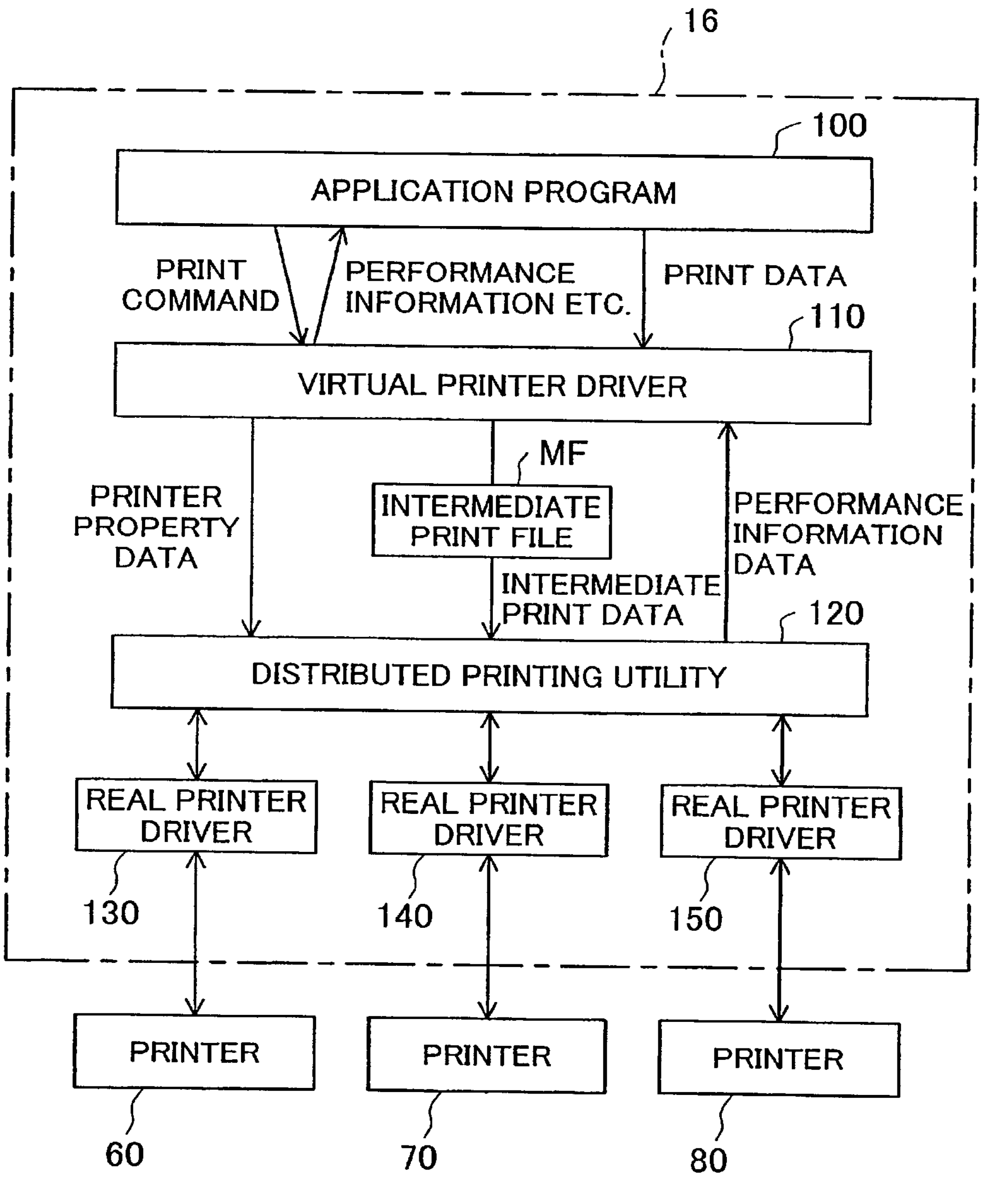
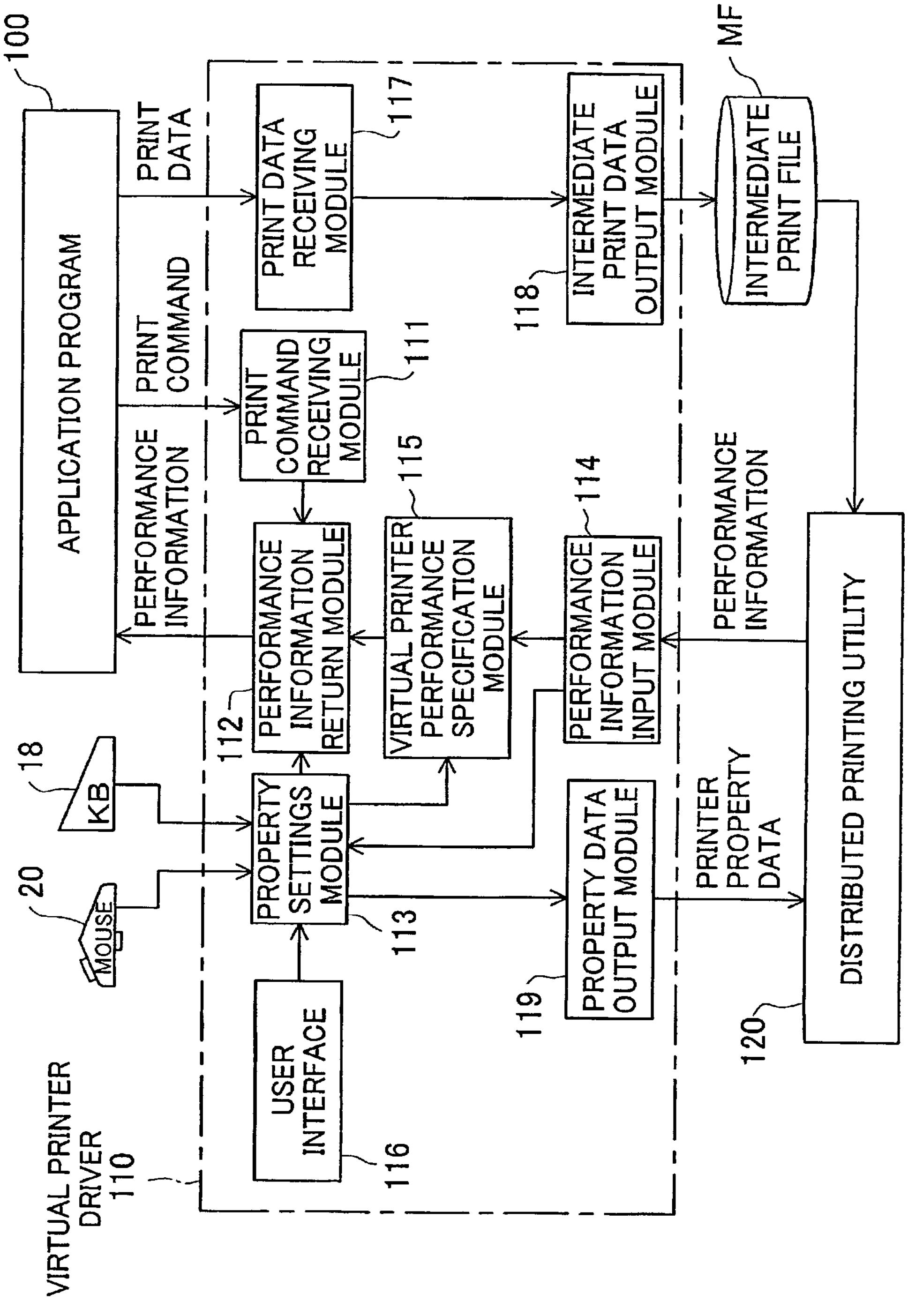

16
100
APPLICATION PROGRAM
PRINT COMMAND
PERFORMANCE INFORMATION ETC.
PRINT DATA
110
VIRTUAL PRINTER DRIVER
MF
PRINTER PROPERTY DATA
INTERMEDIATE PRINT FILE
INTERMEDIATE PRINT DATA
PERFORMANCE INFORMATION DATA
120
DISTRIBUTED PRINTING UTILITY
REAL PRINTER DRIVER
REAL PRINTER DRIVER
REAL PRINTER DRIVER
130
140
150
PRINTER
PRINTER
PRINTER
60
70
80

Fig.3



VIRTUAL PRINTER DRIVER 110
100
APPLICATION PROGRAM
PRINT DATA
PRINT COMMAND
PERFORMANCE INFORMATION
PRINT DATA RECEIVING MODULE
117
PRINT COMMAND RECEIVING MODULE
111
PERFORMANCE INFORMATION RETURN MODULE
112
VIRTUAL PRINTER PERFORMANCE SPECIFICATION MODULE
115
PERFORMANCE INFORMATION INPUT MODULE
114
INTERMEDIATE PRINT DATA OUTPUT MODULE
118
MF
INTERMEDIATE PRINT FILE
PERFORMANCE INFORMATION
DISTRIBUTED PRINTING UTILITY
120
PRINTER PROPERTY DATA
PROPERTY DATA OUTPUT MODULE
119
PROPERTY SETTINGS MODULE
113
USER INTERFACE
116
KB
18
MOUSE
20

Fig.4

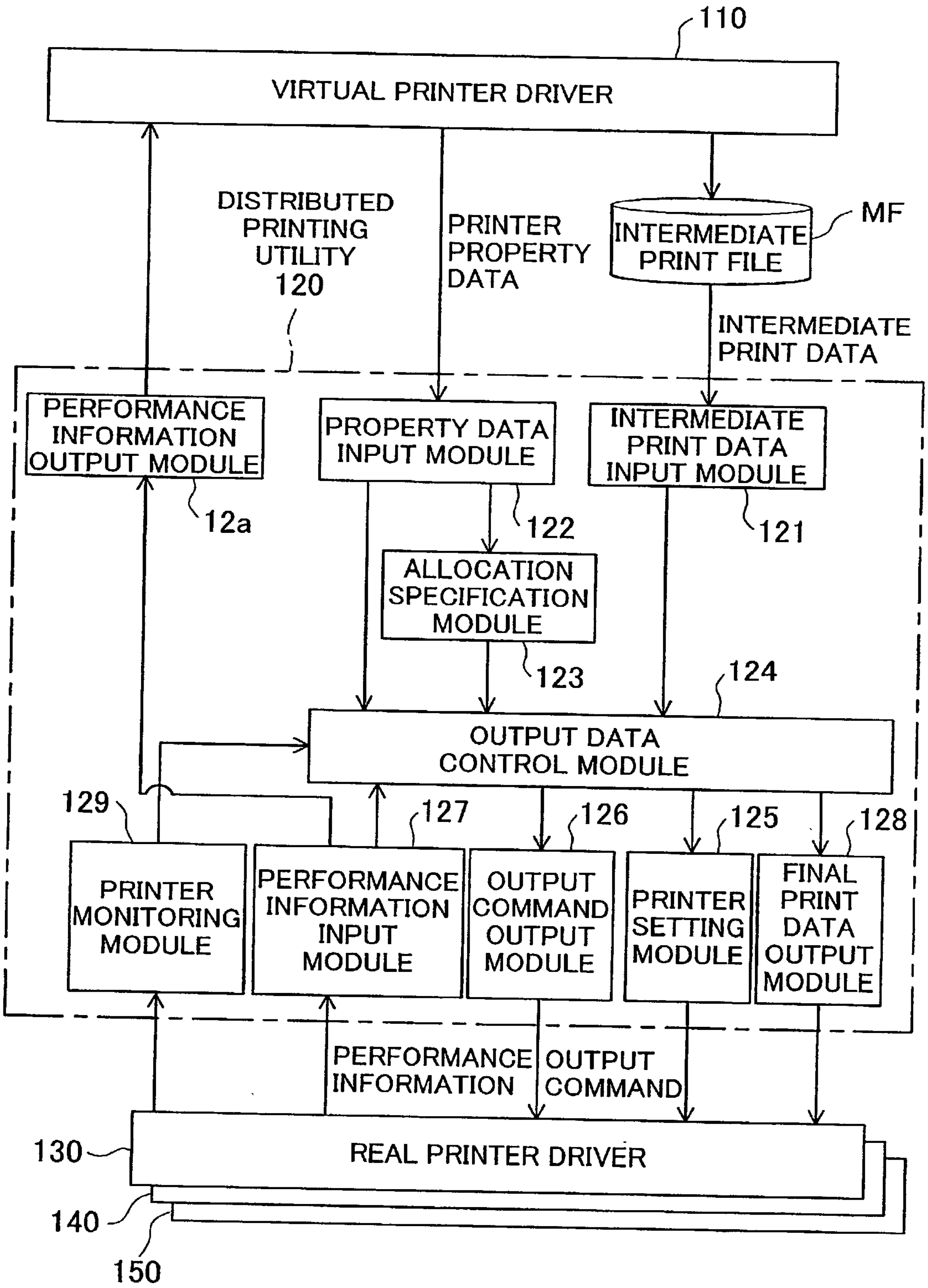

110
VIRTUAL PRINTER DRIVER
DISTRIBUTED PRINTING UTILITY
120
PRINTER PROPERTY DATA
INTERMEDIATE PRINT FILE
MF
INTERMEDIATE PRINT DATA
PERFORMANCE INFORMATION OUTPUT MODULE
12a
PROPERTY DATA INPUT MODULE
122
INTERMEDIATE PRINT DATA INPUT MODULE
121
ALLOCATION SPECIFICATION MODULE
123
124
OUTPUT DATA CONTROL MODULE
129
127
126
125
128
PRINTER MONITORING MODULE
PERFORMANCE INFORMATION INPUT MODULE
OUTPUT COMMAND OUTPUT MODULE
PRINTER SETTING MODULE
FINAL PRINT DATA OUTPUT MODULE
PERFORMANCE INFORMATION
OUTPUT COMMAND
130
REAL PRINTER DRIVER
140
150

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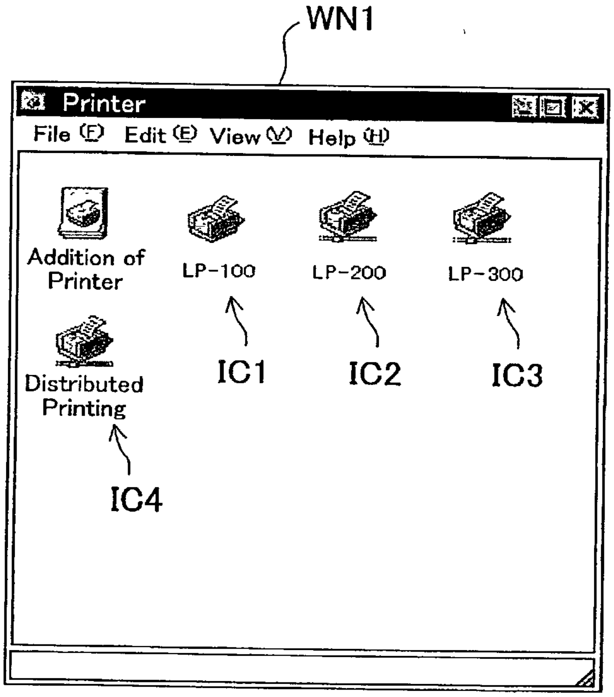
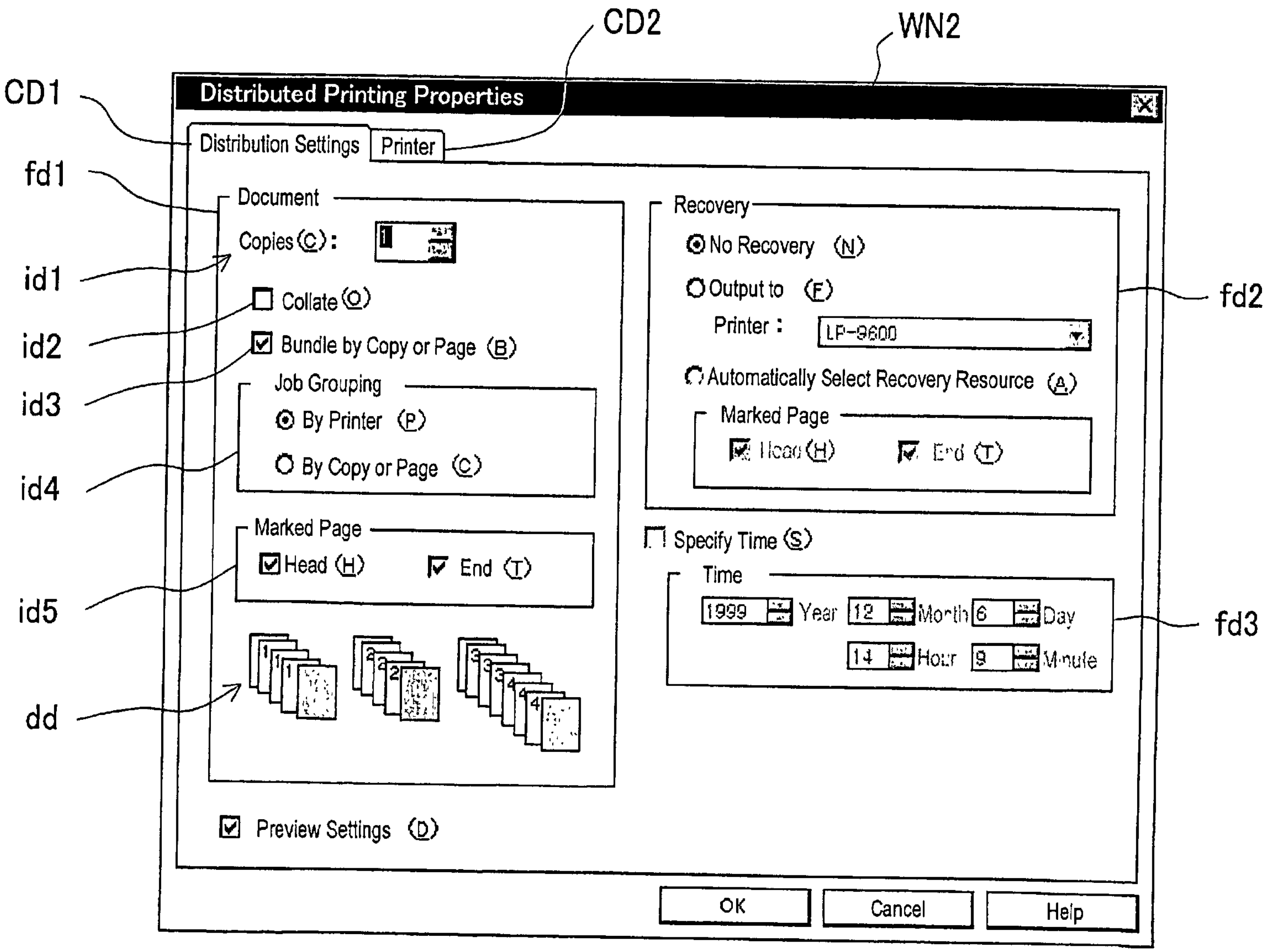
Fig.5


WN1
Printer
File (F) Edit (E) View (V) Help (H)
Addition of Printer
LP-100
LP-200
LP-300
Distributed Printing
IC1
IC2
IC3
IC4

09980111.110601

Fig.6



Distributed Printing Properties

Distribution Settings | Printer

Document

Copies (C): 1

☐ Collate (O)

☑ Bundle by Copy or Page (B)

Job Grouping

● By Printer (P)

○ By Copy or Page (C)

Marked Page

☑ Head (H) ☑ End (T)

Recovery

● No Recovery (N)

○ Output to (F)

Printer : LP-9600

○ Automatically Select Recovery Resource (A)

Marked Page

☑ Head (H) ☑ End (T)

☐ Specify Time (S)

Time

1999 Year 12 Month 6 Day

14 Hour 9 Minute

☑ Preview Settings (D)

OK | Cancel | Help

Fig.7

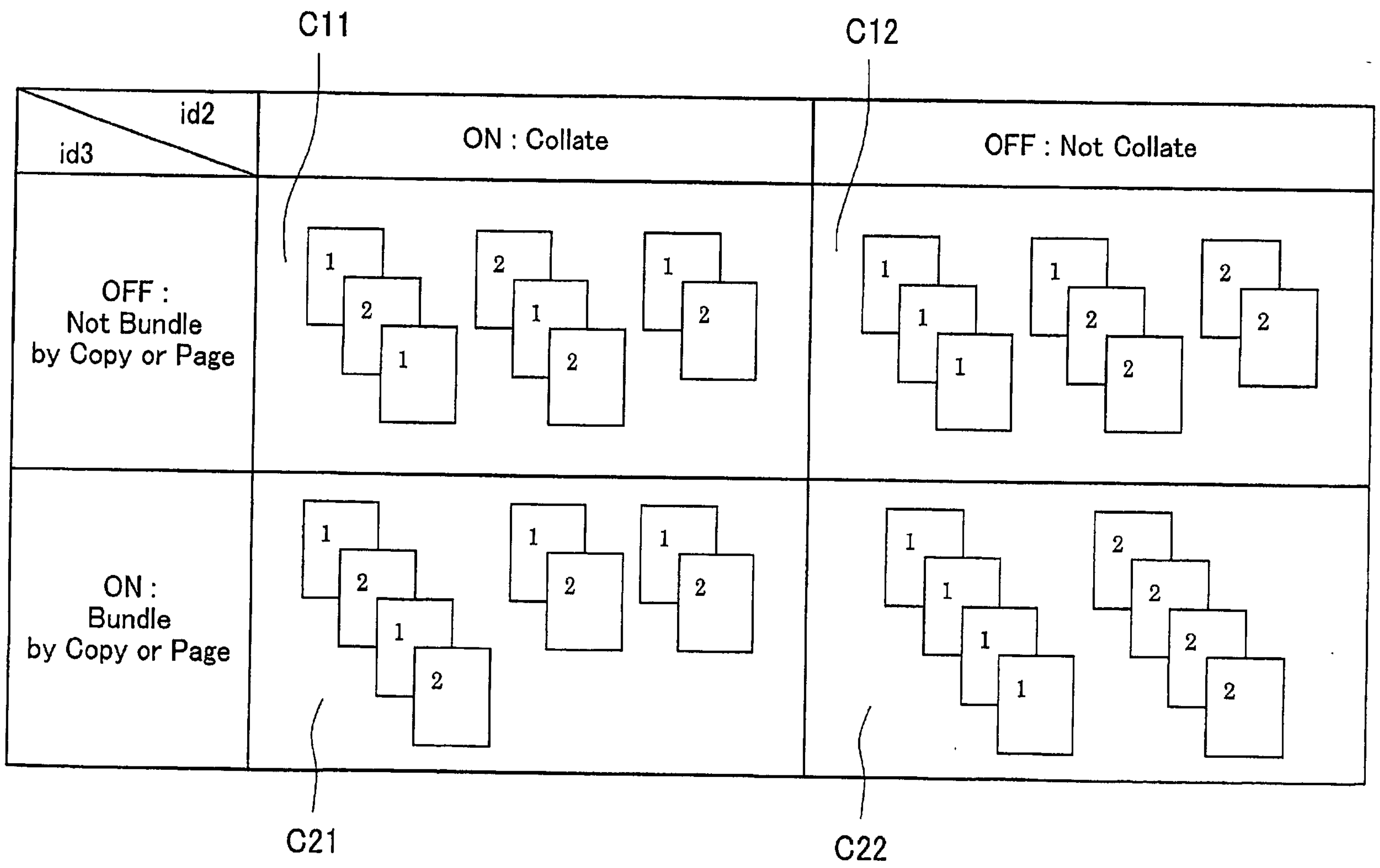

C11
C12
id2
id3
ON : Collate
OFF : Not Collate
OFF :
Not Bundle
by Copy or Page
ON :
Bundle
by Copy or Page
1
2
C21
C22

Fig.8

SPEED PREFERENCE MODE

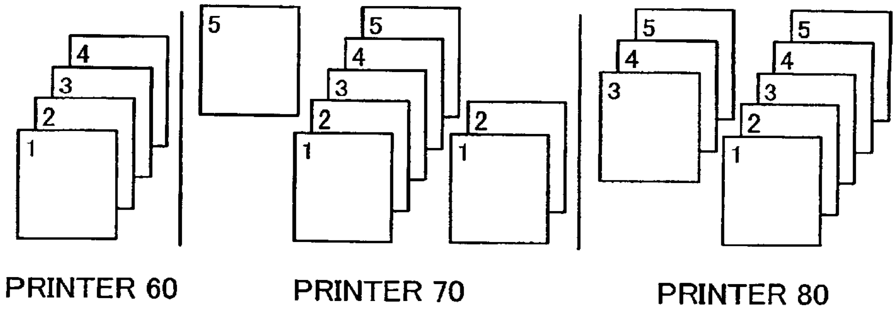
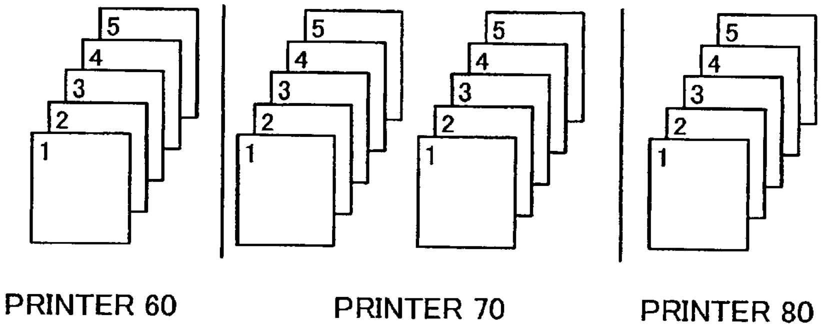

4
3
2
1
5
5
4
3
2
1
2
1
5
4
3
5
4
3
2
1
PRINTER 60
PRINTER 70
PRINTER 80

Fig.9

HANDLING PREFERENCE MODE


5
4
3
2
1
5
4
3
2
1
5
4
3
2
1
5
4
3
2
1
PRINTER 60
PRINTER 70
PRINTER 80

09980111.113001

Fig.10

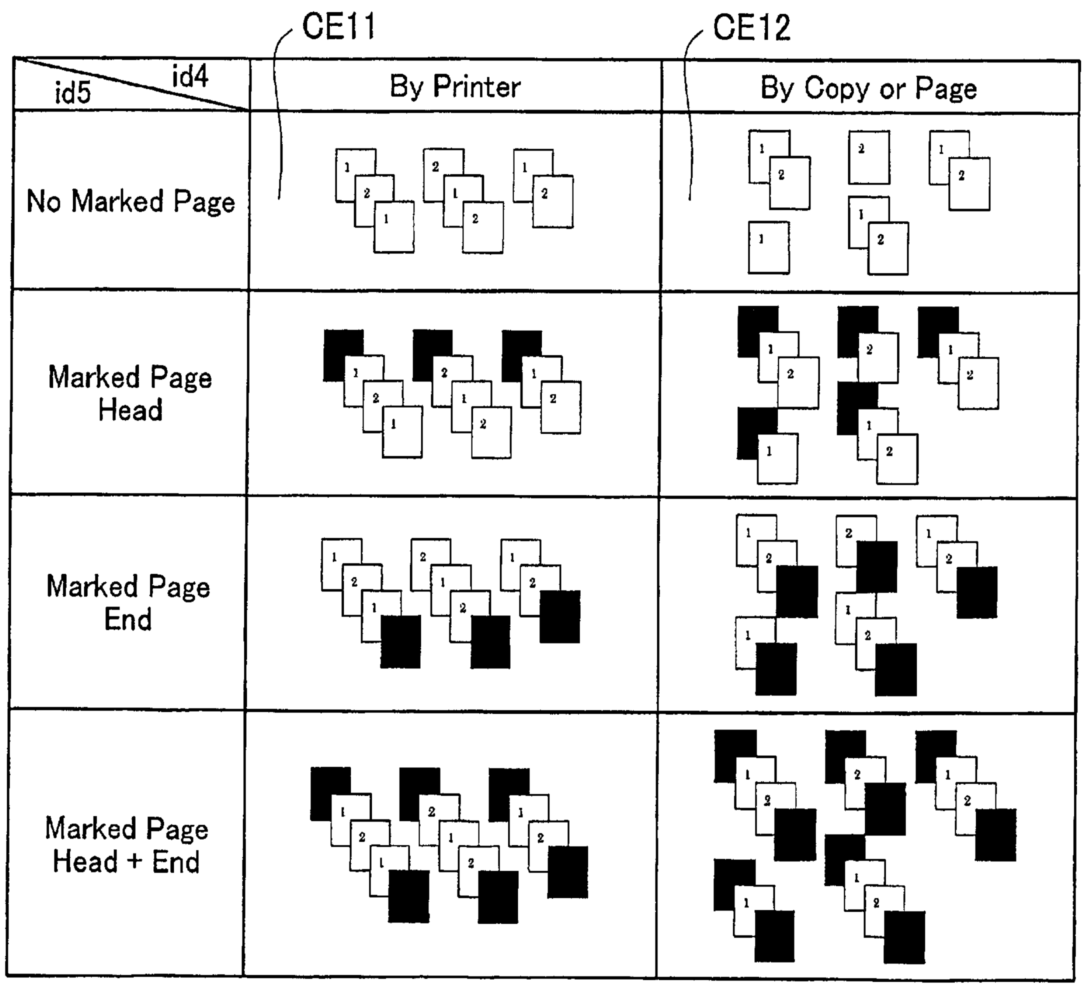
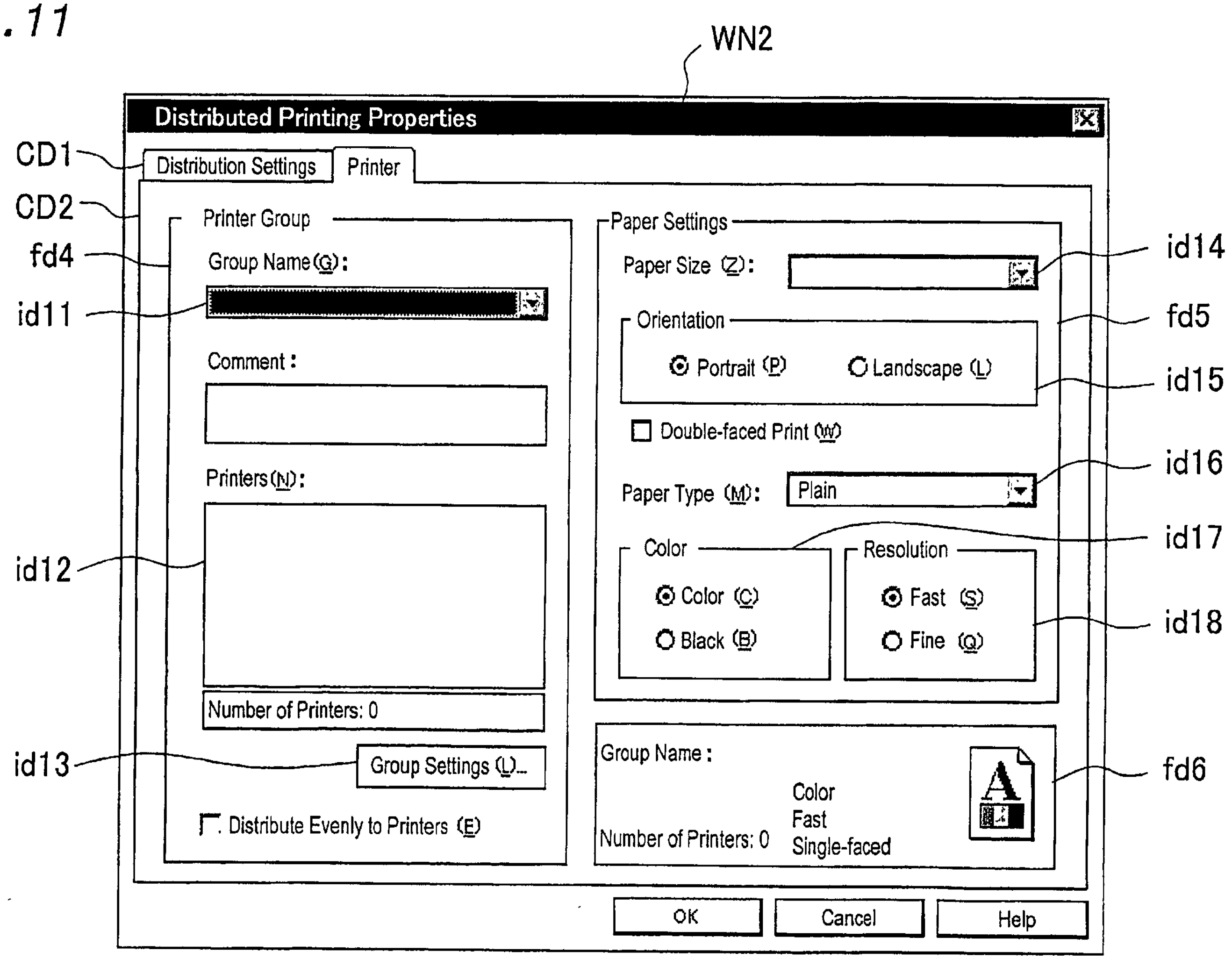

CE11
CE12
id4
id5
By Printer
By Copy or Page
No Marked Page
Marked Page Head
Marked Page End
Marked Page Head + End
1
2

Fig.11


WN2
CD1
CD2
fd4
id11
id12
id13
id14
fd5
id15
id16
id17
id18
fd6
Distributed Printing Properties
Distribution Settings
Printer
Printer Group
Group Name (G):
Comment :
Printers (N):
Group Settings (L)...
Paper Settings
Paper Size (Z):
Orientation
Resolution
OK
Cancel
Help

Number of Printers: 0

☐ Distribute Evenly to Printers (E)

● Portrait (P) ○ Landscape (L)

☐ Double-faced Print (W)

Paper Type (M): Plain

Color: ● Color (C) ○ Black (B)

Resolution: ● Fast (S) ○ Fine (Q)

Group Name :

Number of Printers: 0

Color
Fast
Single-faced

09580111.11301

Fig. 12

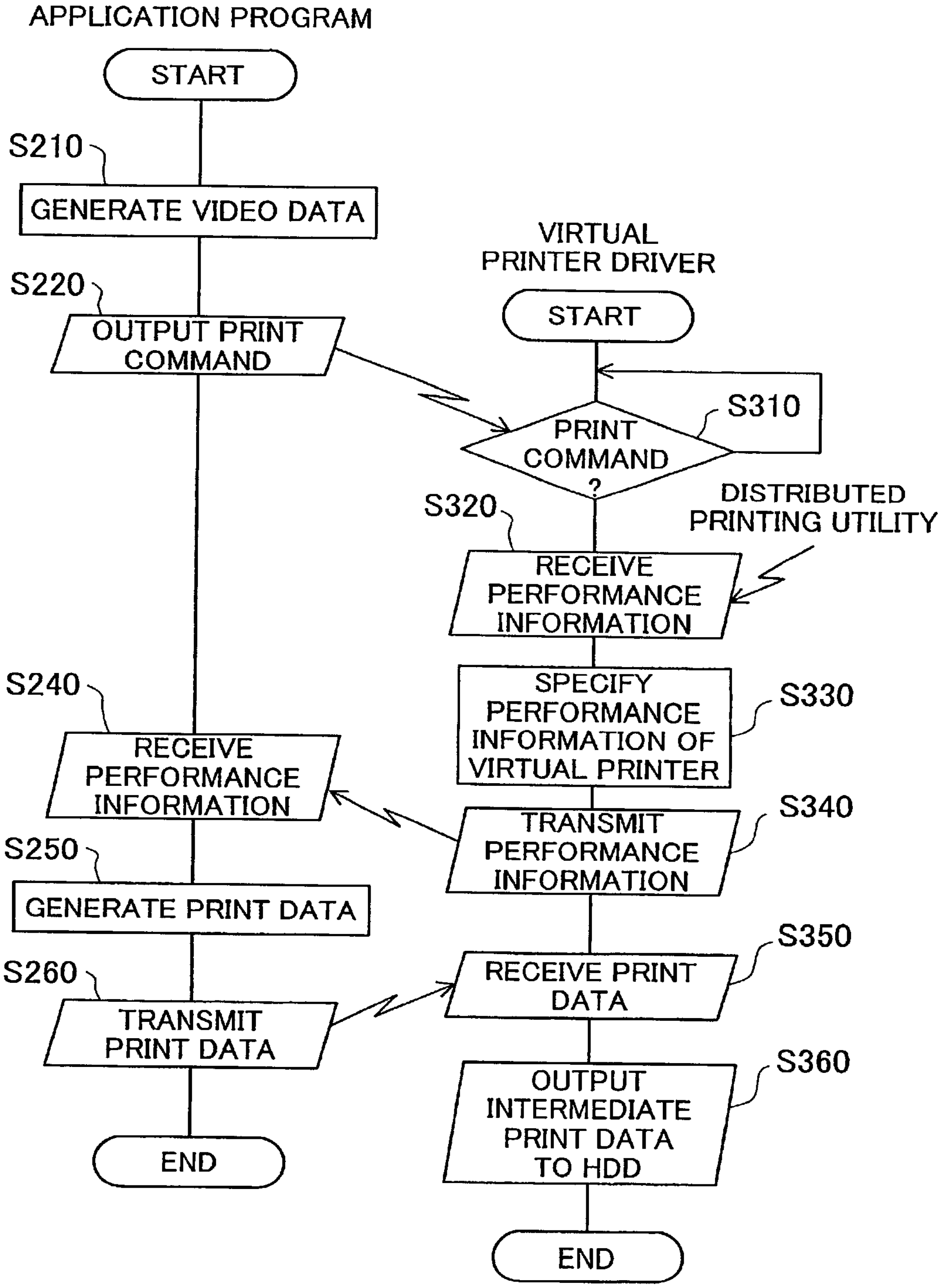
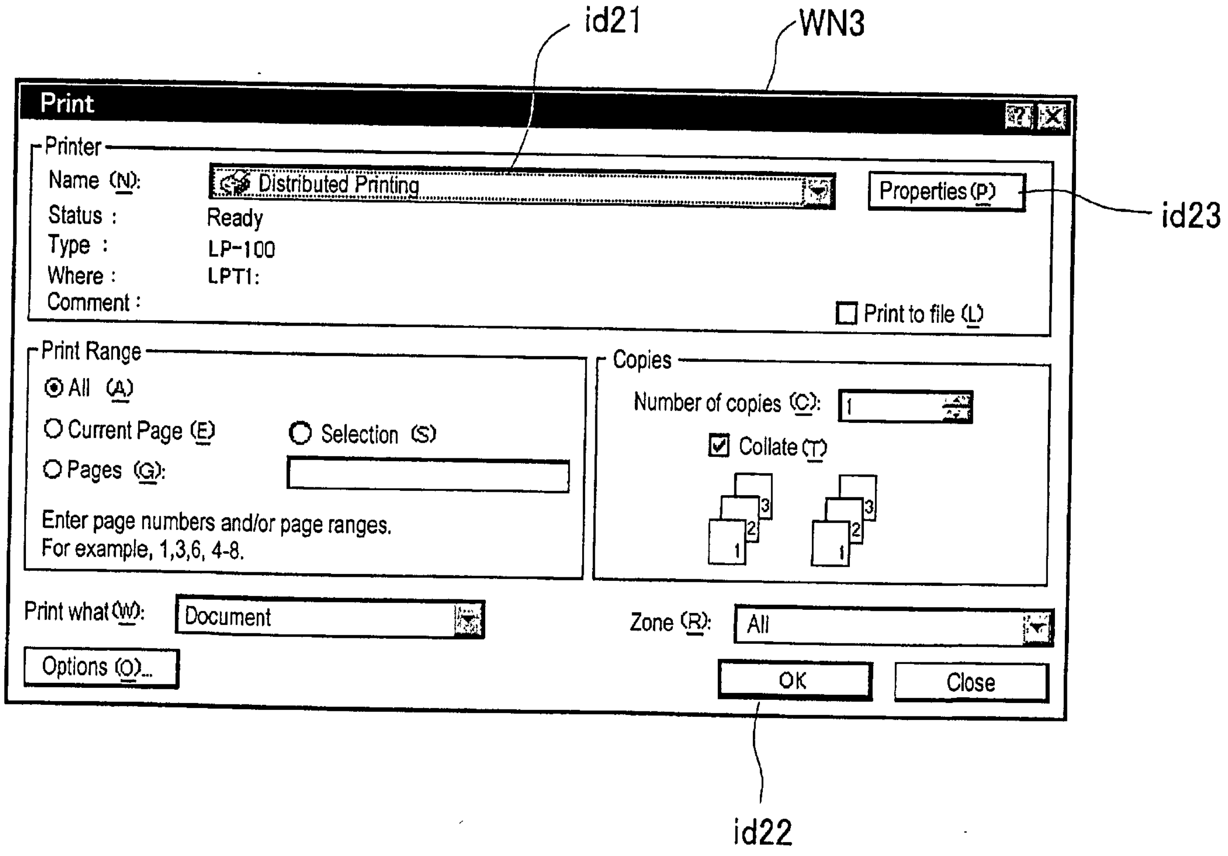

APPLICATION PROGRAM
START
S210
GENERATE VIDEO DATA
S220
OUTPUT PRINT COMMAND
S240
RECEIVE PERFORMANCE INFORMATION
S250
GENERATE PRINT DATA
S260
TRANSMIT PRINT DATA
END
VIRTUAL PRINTER DRIVER
START
S310
PRINT COMMAND ?
DISTRIBUTED PRINTING UTILITY
S320
RECEIVE PERFORMANCE INFORMATION
SPECIFY PERFORMANCE INFORMATION OF VIRTUAL PRINTER
S330
TRANSMIT PERFORMANCE INFORMATION
S340
RECEIVE PRINT DATA
S350
OUTPUT INTERMEDIATE PRINT DATA TO HDD
S360
END

Fig. 13



id21
WN3
id23
id22
Print
Printer
Properties (P)
Print Range
Copies
Options (O)...
OK
Close

Name (N): Distributed Printing
Status : Ready
Type : LP-100
Where : LPT1:
Comment :

☐ Print to file (L)

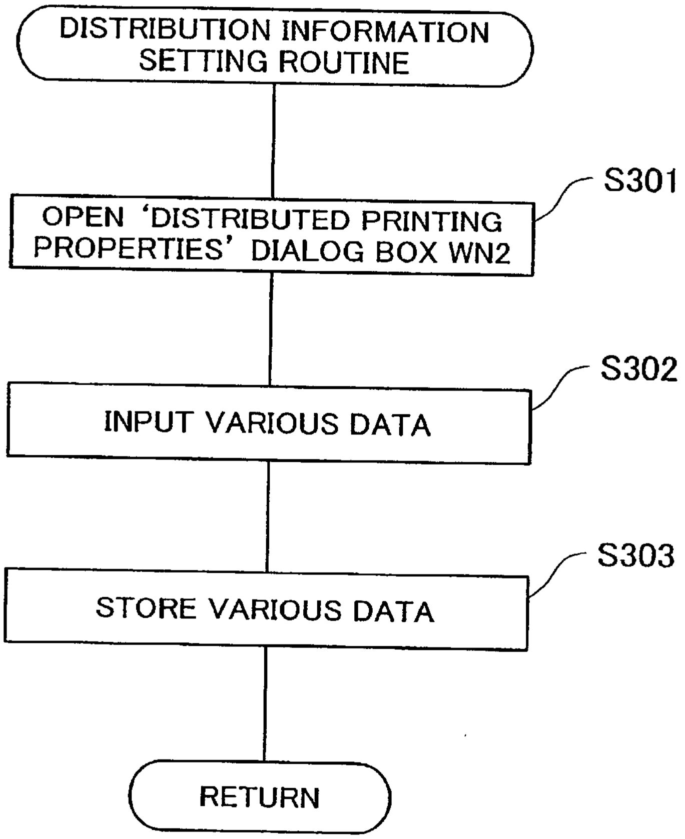
● All (A)
○ Current Page (E)
○ Selection (S)
○ Pages (G):

Enter page numbers and/or page ranges.
For example, 1,3,6, 4-8.

Number of copies (C): 1
☑ Collate (T)

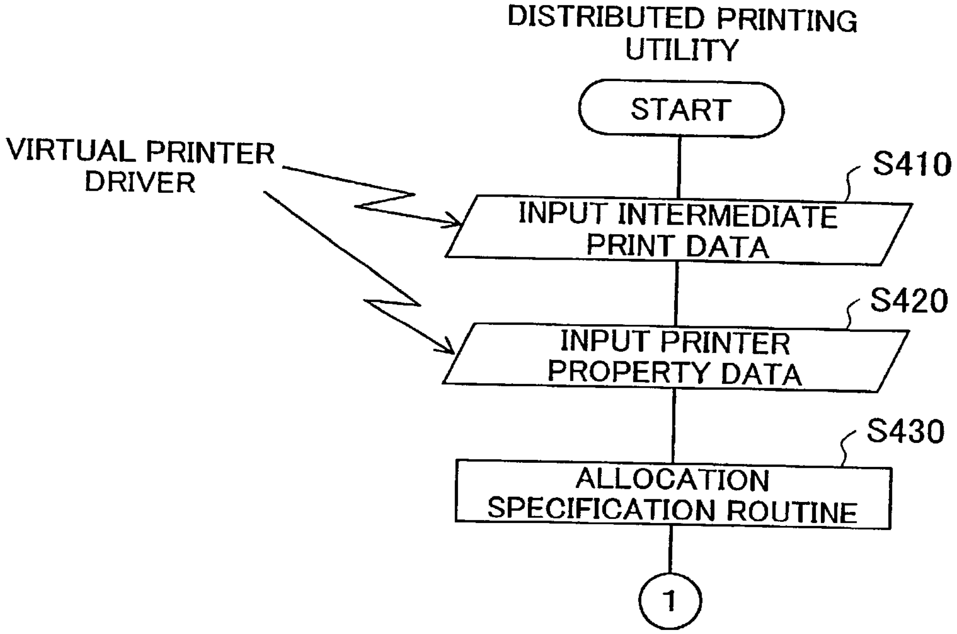
Print what (W): Document
Zone (R): All

Fig.14


DISTRIBUTION INFORMATION SETTING ROUTINE
S301
OPEN 'DISTRIBUTED PRINTING PROPERTIES' DIALOG BOX WN2
S302
INPUT VARIOUS DATA
S303
STORE VARIOUS DATA
RETURN

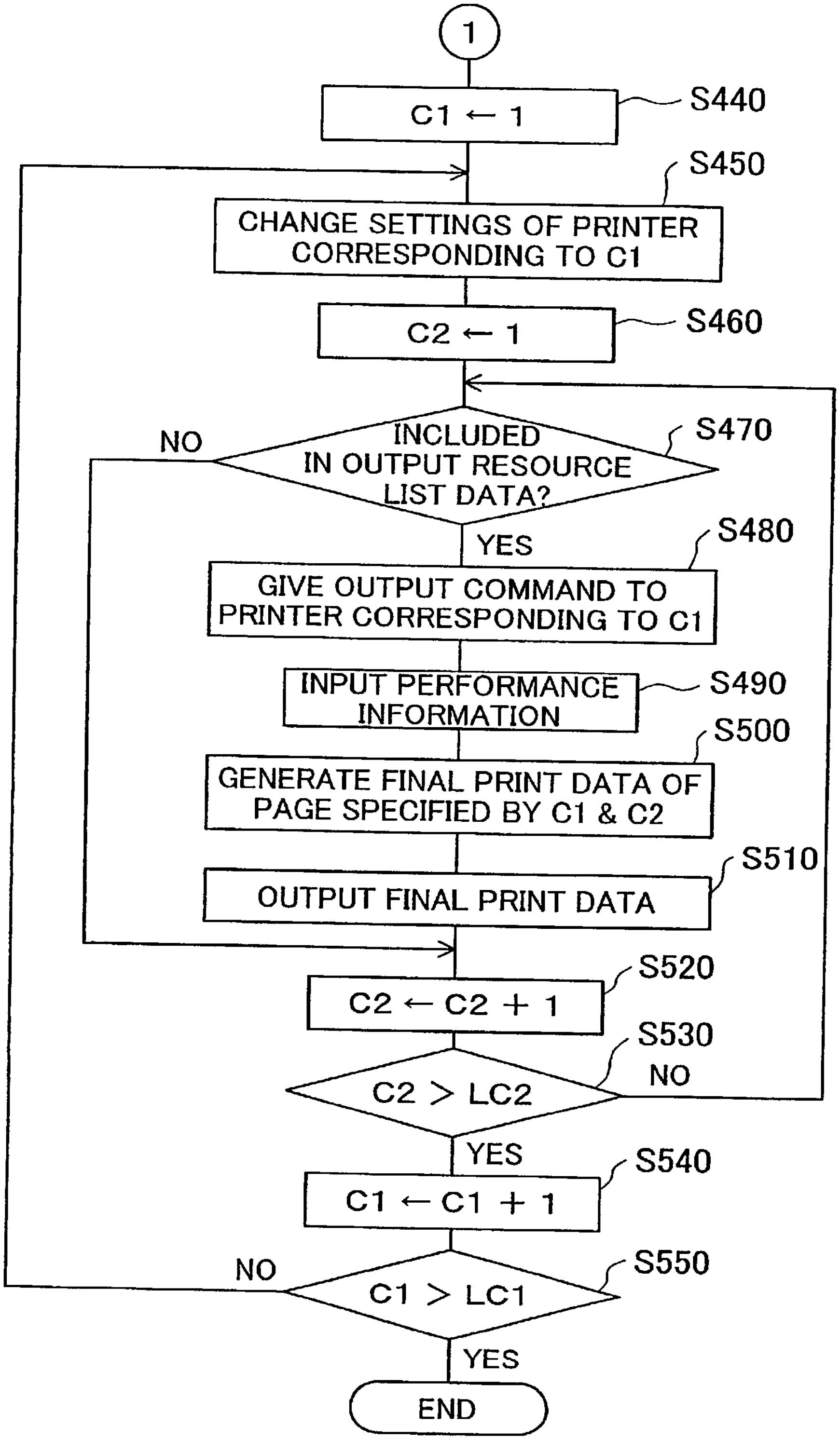
09930111.100901

Fig.15


DISTRIBUTED PRINTING UTILITY
START
VIRTUAL PRINTER DRIVER
S410
INPUT INTERMEDIATE PRINT DATA
S420
INPUT PRINTER PROPERTY DATA
S430
ALLOCATION SPECIFICATION ROUTINE
1

09980111.100501

Fig.16


1
C1 ← 1
S440
CHANGE SETTINGS OF PRINTER CORRESPONDING TO C1
S450
C2 ← 1
S460
INCLUDED IN OUTPUT RESOURCE LIST DATA?
S470
NO
YES
GIVE OUTPUT COMMAND TO PRINTER CORRESPONDING TO C1
S480
INPUT PERFORMANCE INFORMATION
S490
GENERATE FINAL PRINT DATA OF PAGE SPECIFIED BY C1 & C2
S500
OUTPUT FINAL PRINT DATA
S510
C2 ← C2 + 1
S520
C2 > LC2
S530
NO
YES
C1 ← C1 + 1
S540
C1 > LC1
S550
NO
YES
END

10051774.110901

Fig. 17

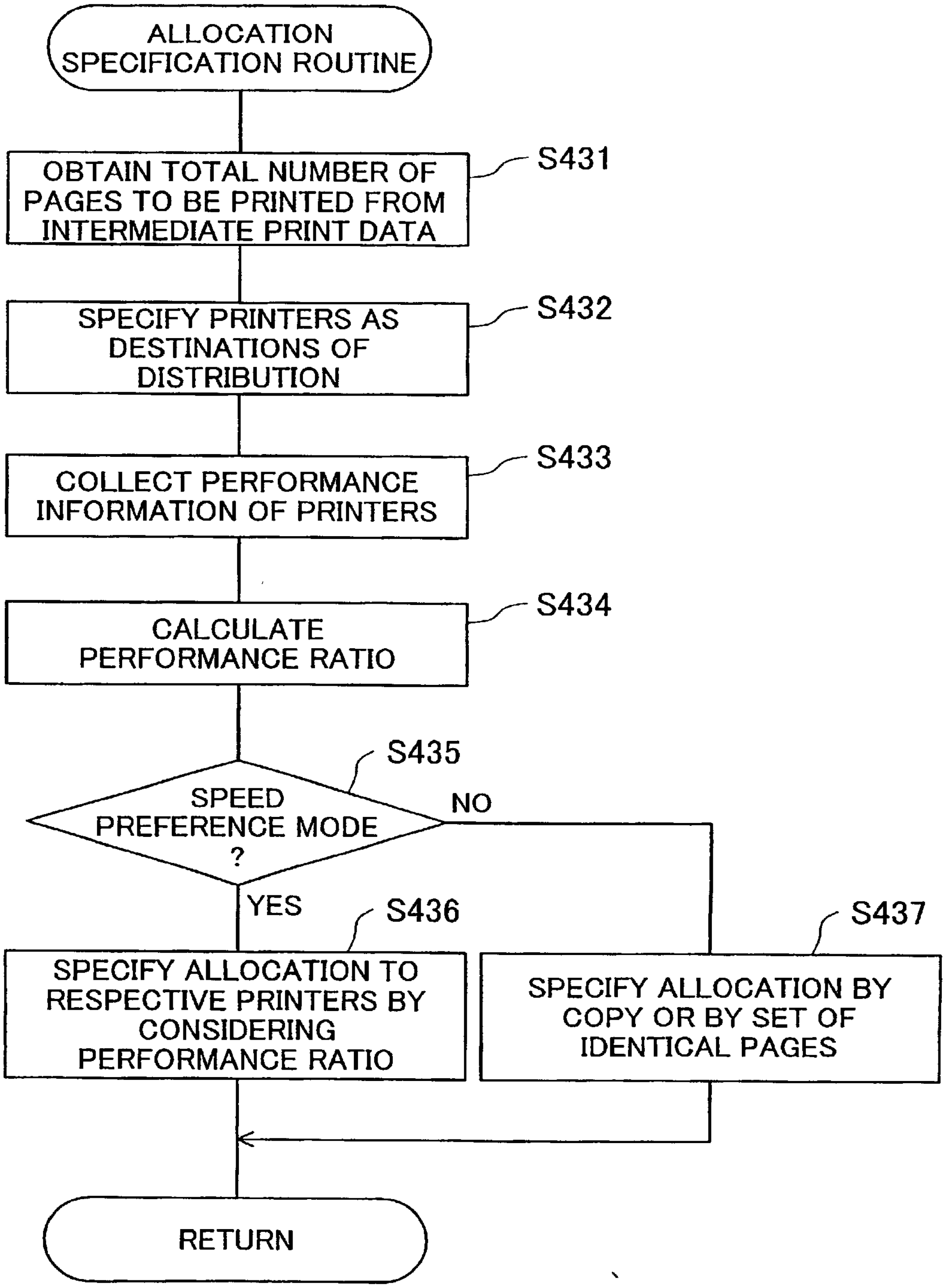

ALLOCATION SPECIFICATION ROUTINE
S431
OBTAIN TOTAL NUMBER OF PAGES TO BE PRINTED FROM INTERMEDIATE PRINT DATA
S432
SPECIFY PRINTERS AS DESTINATIONS OF DISTRIBUTION
S433
COLLECT PERFORMANCE INFORMATION OF PRINTERS
S434
CALCULATE PERFORMANCE RATIO
S435
SPEED PREFERENCE MODE ?
NO
YES
S436
SPECIFY ALLOCATION TO RESPECTIVE PRINTERS BY CONSIDERING PERFORMANCE RATIO
S437
SPECIFY ALLOCATION BY COPY OR BY SET OF IDENTICAL PAGES
RETURN

Fig.18

Output Resources	Page Numbers
Printer 60	1、2、3、4
Printer 70	5、1、2、3、4、5、1、2
Printer 80	3、4、5、1、2、3、4、5

Fig.19

Output Resources	Page Numbers
Printer 60	1、2、3、4、5
Printer 70	1、2、3、4、5、1、2、3、4、5
Printer 80	1、2、3、4、5

Fig.20

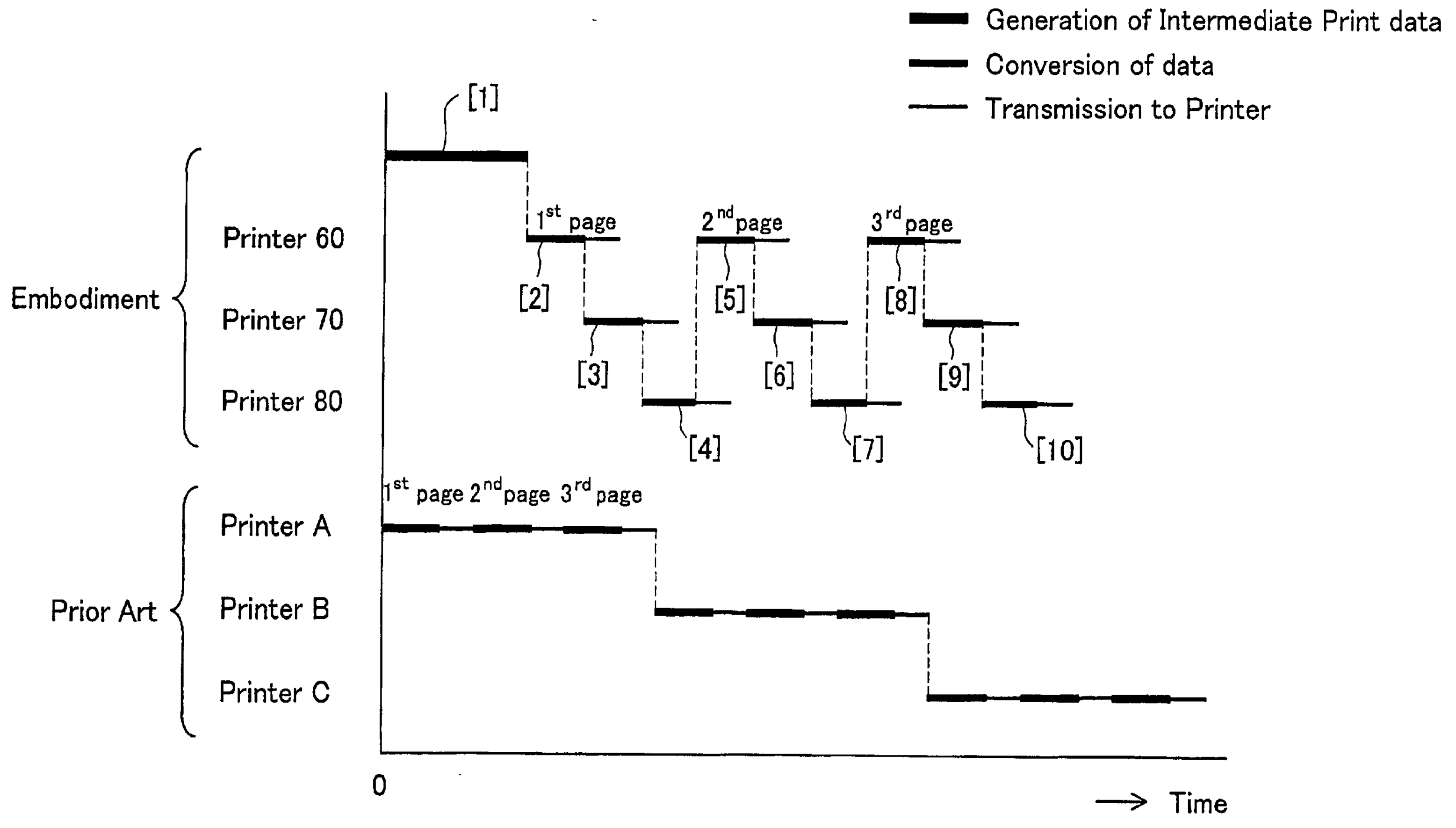
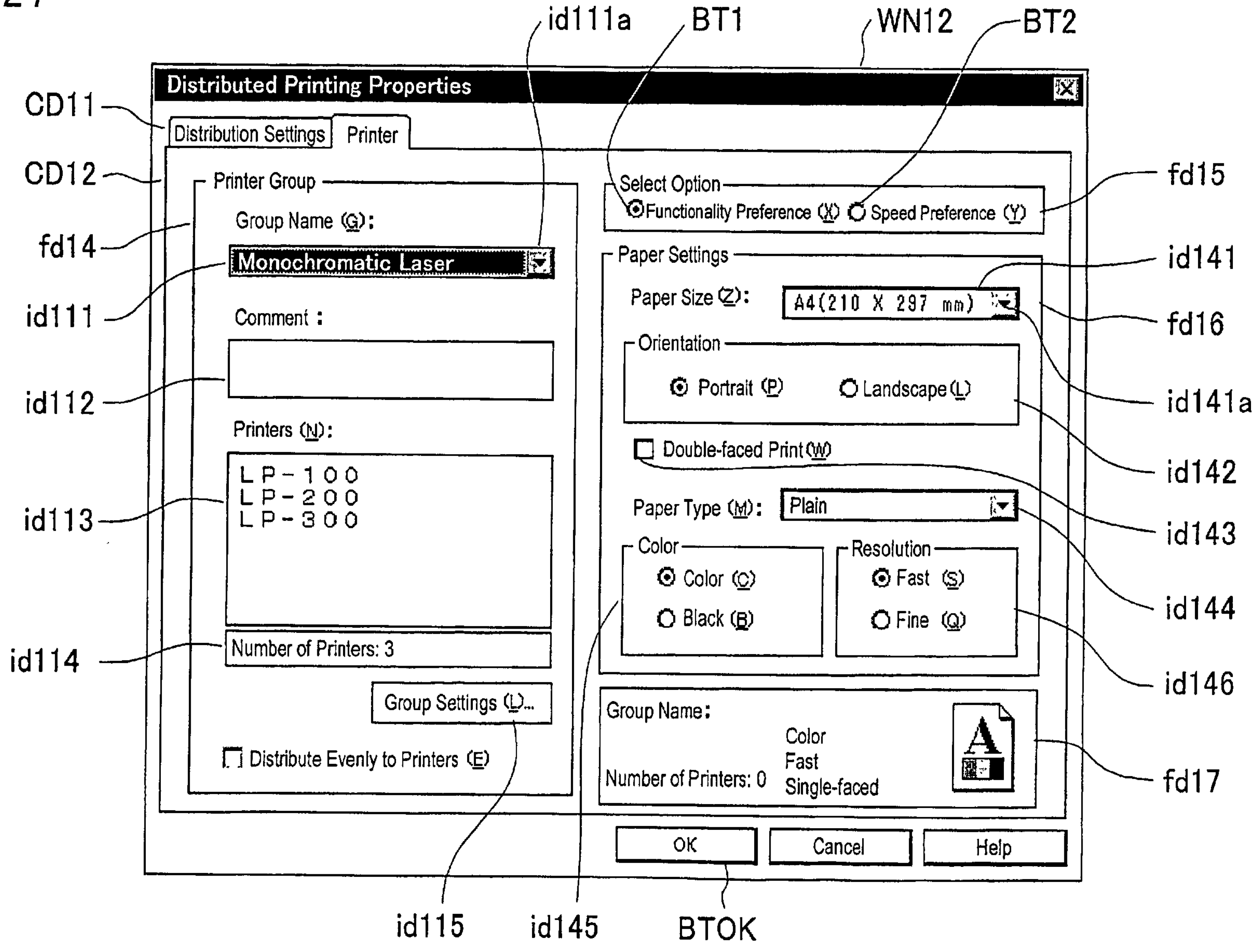

Generation of Intermediate Print data
Conversion of data
Transmission to Printer
Embodiment
Printer 60
Printer 70
Printer 80
Prior Art
Printer A
Printer B
Printer C
[1]
1st page
2nd page
3rd page
[2]
[3]
[4]
[5]
[6]
[7]
[8]
[9]
[10]
1st page 2nd page 3rd page
0
Time

Fig.21



Distributed Printing Properties

Distribution Settings | Printer

Printer Group

Group Name (G): Monochromatic Laser

Comment :

Printers (N):
LP-100
LP-200
LP-300

Number of Printers: 3

☐ Distribute Evenly to Printers (E)

Select Option
● Functionality Preference (X) ○ Speed Preference (Y)

Paper Settings

Paper Size (Z): A4(210 X 297 mm)

Orientation
● Portrait (P) ○ Landscape (L)

☐ Double-faced Print (W)

Paper Type (M): Plain

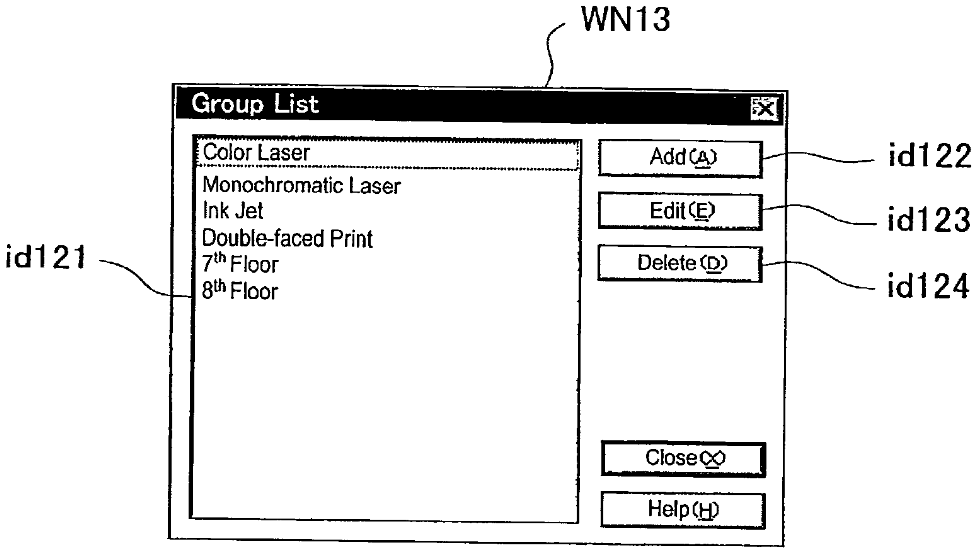
Color
● Color (C)
○ Black (B)

Resolution
● Fast (S)
○ Fine (Q)

Group Name:
Number of Printers: 0
Color
Fast
Single-faced

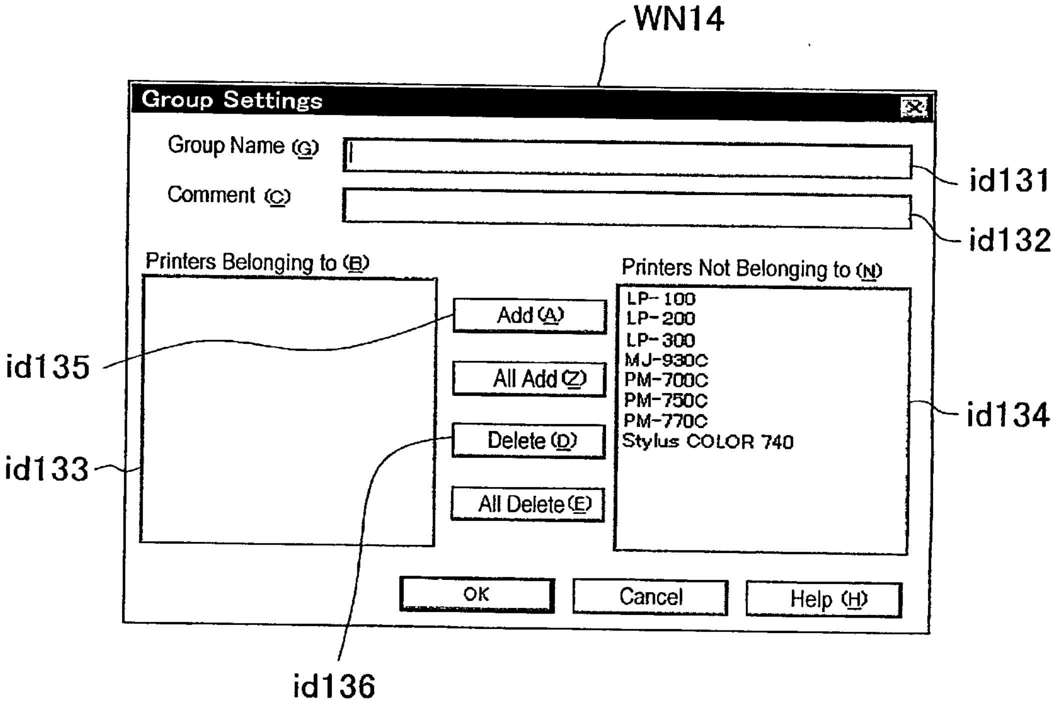
id111a
BT1
WN12
BT2
CD11
CD12
fd14
id111
id112
id113
id114
fd15
id141
fd16
id141a
id142
id143
id144
id146
fd17
id115
id145
BTOK
Group Settings (L)...
OK
Cancel
Help

Fig.22


WN13
Group List
Add(A)
Edit(E)
Delete(D)
Close(X)
Help(H)
id121
id122
id123
id124

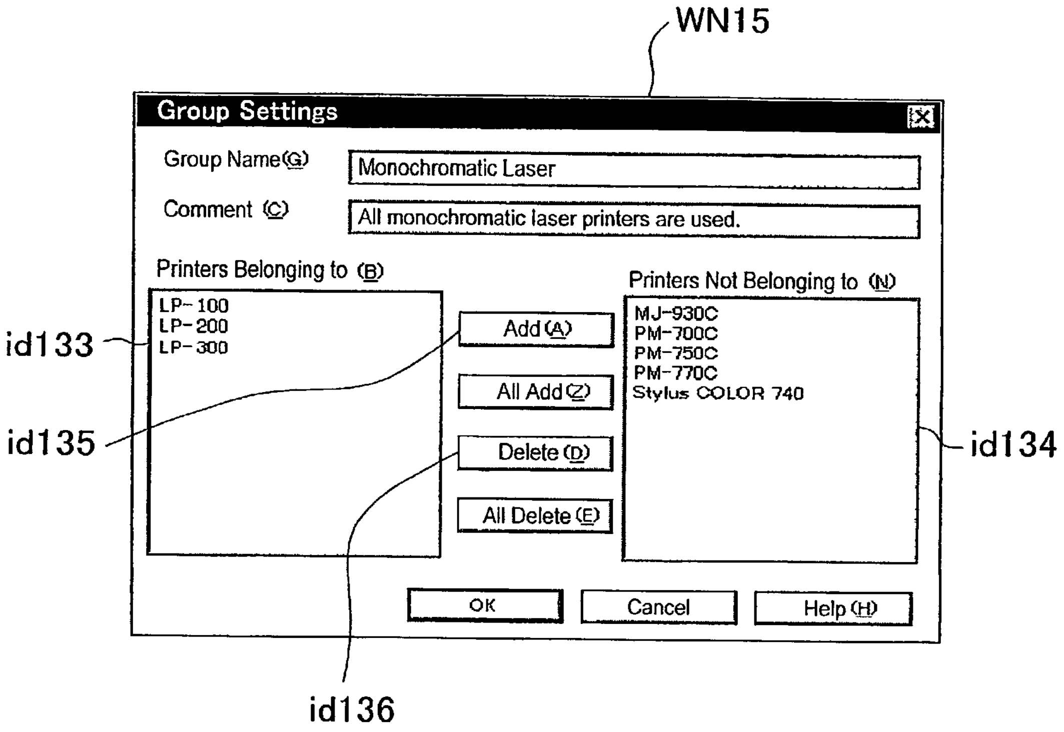
Color Laser
Monochromatic Laser
Ink Jet
Double-faced Print
7th Floor
8th Floor

Fig.23


WN14
Group Settings
Group Name (G)
Comment (C)
Printers Belonging to (B)
Printers Not Belonging to (N)
Add (A)
All Add (Z)
Delete (D)
All Delete (E)
OK
Cancel
Help (H)
id131
id132
id133
id134
id135
id136

LP-100
LP-200
LP-300
MJ-930C
PM-700C
PM-750C
PM-770C
Stylus COLOR 740

Fig.24


WN15
Group Settings
☒
Add (A)
All Add (Z)
Delete (D)
All Delete (E)
OK
Cancel
Help (H)
id133
id135
id134
id136

Group Name(G): Monochromatic Laser

Comment (C): All monochromatic laser printers are used.

Printers Belonging to (B)
LP-100
LP-200
LP-300

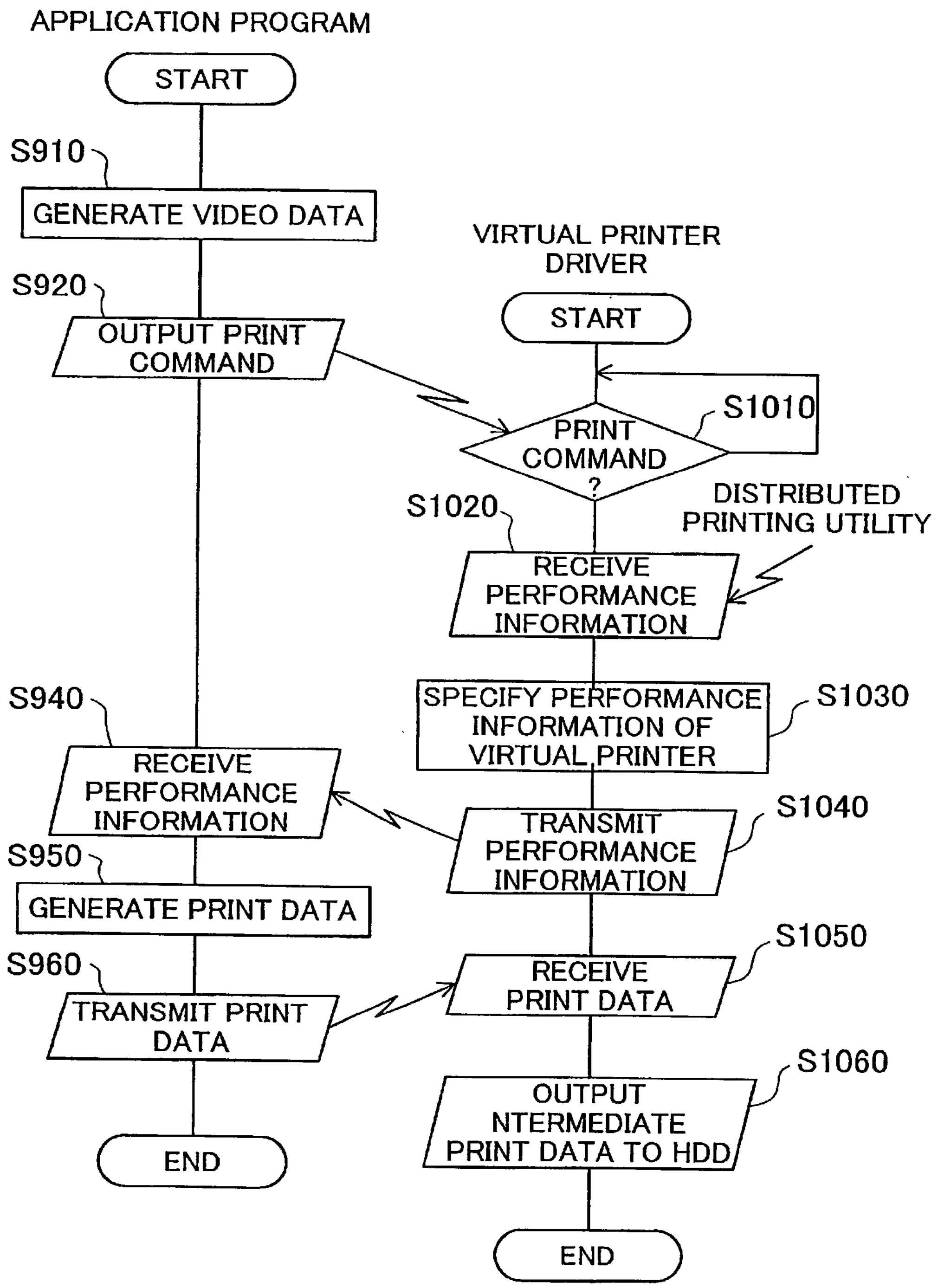
Printers Not Belonging to (N)
MJ-930C
PM-700C
PM-750C
PM-770C
Stylus COLOR 740

Fig.25

PD

GROUP NAMES	PRINTER NAMES	COMMENTS
MONOCHROMATIC LASER	LP-100,LP-200,LP-300	...
INK JET	PM-700C,PM-750C,PM-770C	...

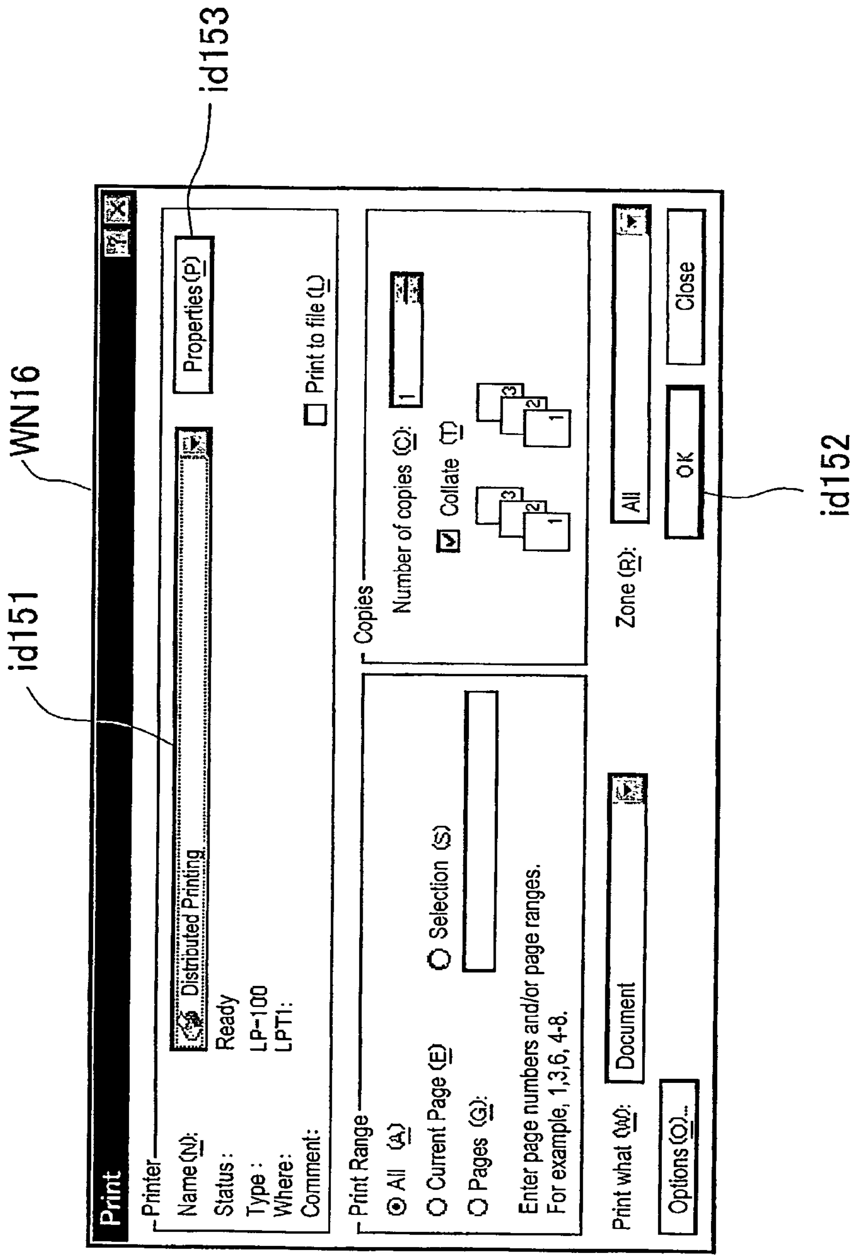
Fig. 26


APPLICATION PROGRAM
START
S910
GENERATE VIDEO DATA
S920
OUTPUT PRINT COMMAND
S940
RECEIVE PERFORMANCE INFORMATION
S950
GENERATE PRINT DATA
S960
TRANSMIT PRINT DATA
END
VIRTUAL PRINTER DRIVER
START
S1010
PRINT COMMAND ?
S1020
DISTRIBUTED PRINTING UTILITY
RECEIVE PERFORMANCE INFORMATION
SPECIFY PERFORMANCE INFORMATION OF VIRTUAL PRINTER
S1030
TRANSMIT PERFORMANCE INFORMATION
S1040
RECEIVE PRINT DATA
S1050
OUTPUT NTERMEDIATE PRINT DATA TO HDD
S1060
END

10051111.093360

PF04F99*

09/980111



Print

Printer

Name (N): Distributed Printing

Status : Ready

Type : LP-100

Where : LPT1:

Comment:

Properties (P)

☐ Print to file (L)

Print Range

● All (A)

○ Current Page (E)

○ Selection (S)

○ Pages (G):

Enter page numbers and/or page ranges.
For example, 1,3,6, 4-8.

Copies

Number of copies (C): 1

☑ Collate (T)

Print what (W): Document

Zone (R): All

Options (O)...

OK

Close

Fig.27

Fig. 28

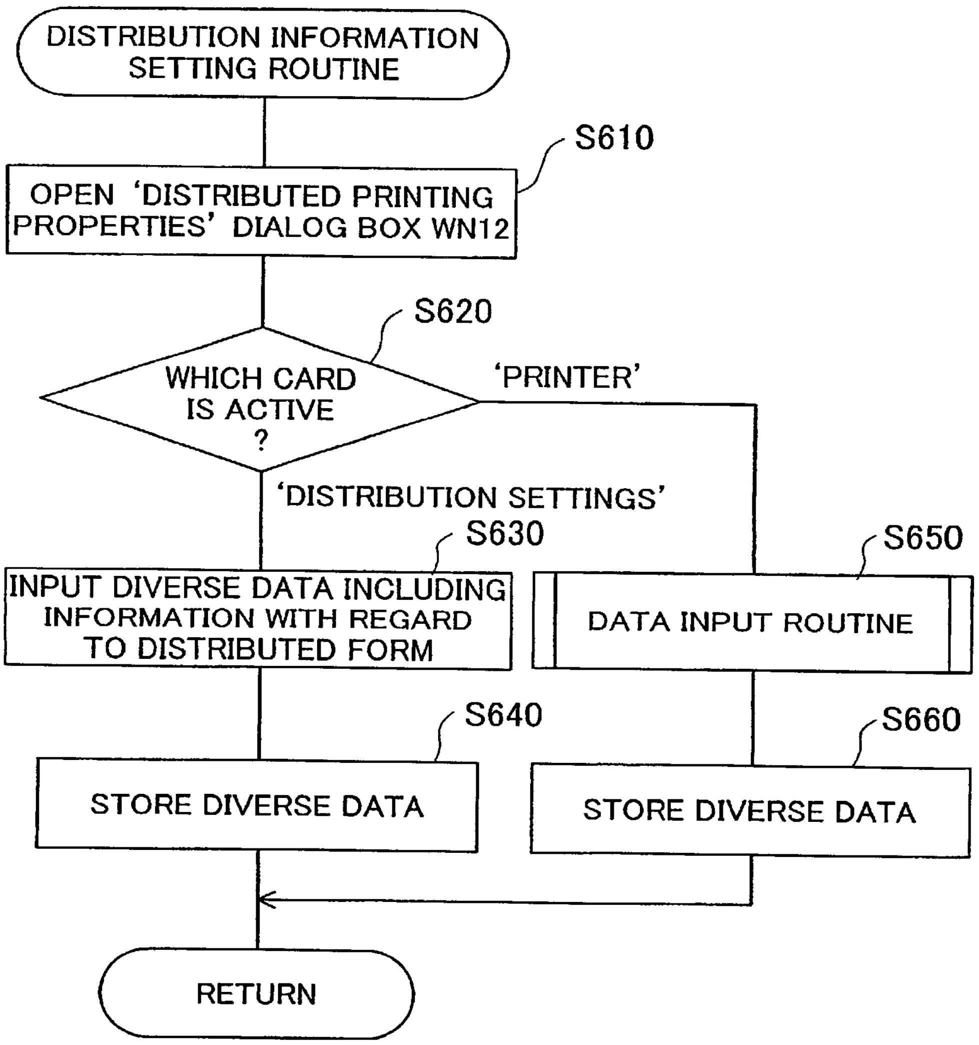

DISTRIBUTION INFORMATION SETTING ROUTINE
S610
OPEN 'DISTRIBUTED PRINTING PROPERTIES' DIALOG BOX WN12
S620
WHICH CARD IS ACTIVE ?
'PRINTER'
'DISTRIBUTION SETTINGS'
S630
INPUT DIVERSE DATA INCLUDING INFORMATION WITH REGARD TO DISTRIBUTED FORM
S650
DATA INPUT ROUTINE
S640
STORE DIVERSE DATA
S660
STORE DIVERSE DATA
RETURN

Fig.29

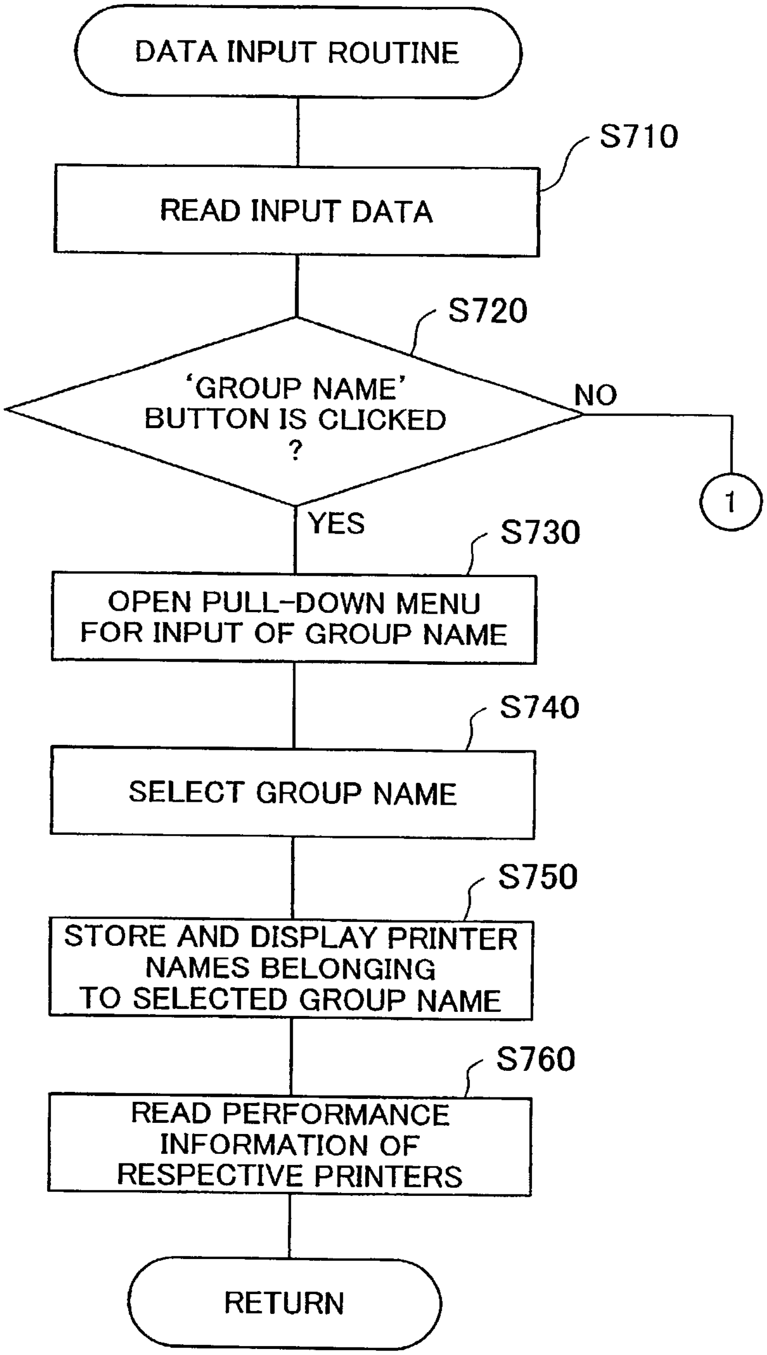

DATA INPUT ROUTINE
S710
READ INPUT DATA
S720
'GROUP NAME' BUTTON IS CLICKED ?
NO
1
YES
S730
OPEN PULL-DOWN MENU FOR INPUT OF GROUP NAME
S740
SELECT GROUP NAME
S750
STORE AND DISPLAY PRINTER NAMES BELONGING TO SELECTED GROUP NAME
S760
READ PERFORMANCE INFORMATION OF RESPECTIVE PRINTERS
RETURN

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Fig.30

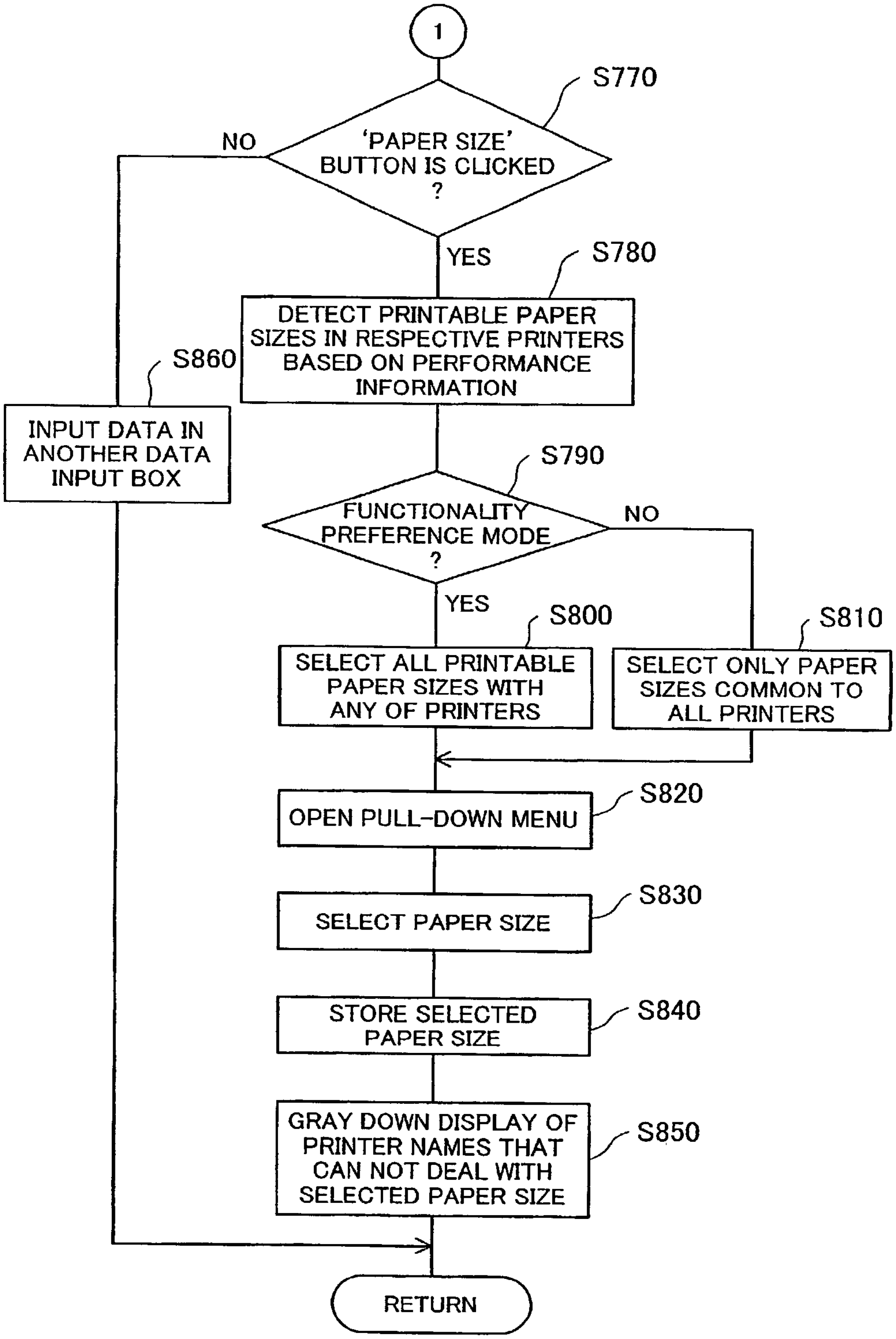
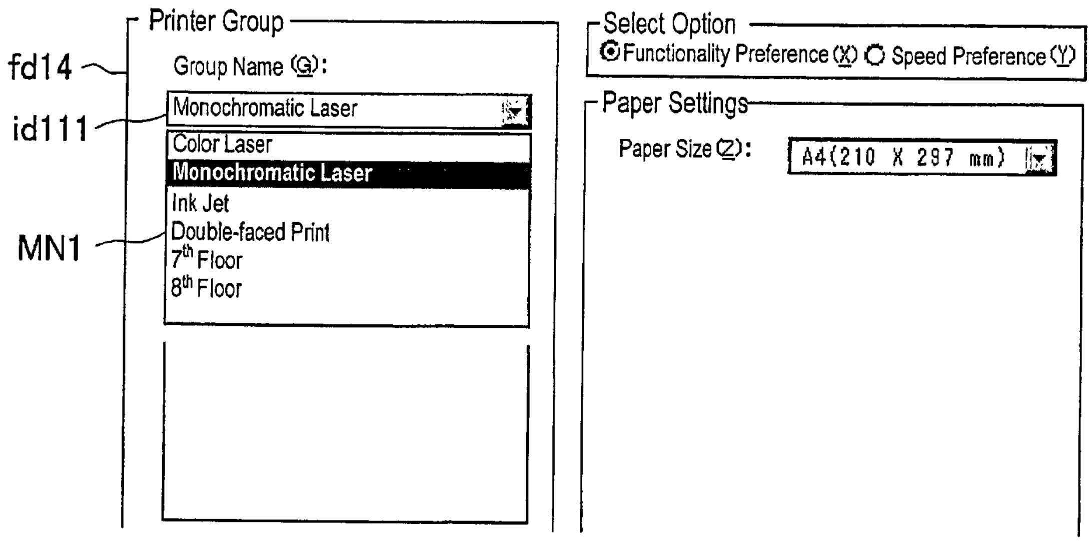

1
S770
'PAPER SIZE' BUTTON IS CLICKED ?
NO
YES
S780
DETECT PRINTABLE PAPER SIZES IN RESPECTIVE PRINTERS BASED ON PERFORMANCE INFORMATION
S860
INPUT DATA IN ANOTHER DATA INPUT BOX
S790
FUNCTIONALITY PREFERENCE MODE ?
NO
YES
S800
SELECT ALL PRINTABLE PAPER SIZES WITH ANY OF PRINTERS
S810
SELECT ONLY PAPER SIZES COMMON TO ALL PRINTERS
S820
OPEN PULL-DOWN MENU
S830
SELECT PAPER SIZE
S840
STORE SELECTED PAPER SIZE
S850
GRAY DOWN DISPLAY OF PRINTER NAMES THAT CAN NOT DEAL WITH SELECTED PAPER SIZE
RETURN

Fig.31



Printer Group

Group Name (G): Monochromatic Laser

- Color Laser
- **Monochromatic Laser**
- Ink Jet
- Double-faced Print
- 7th Floor
- 8th Floor

Select Option

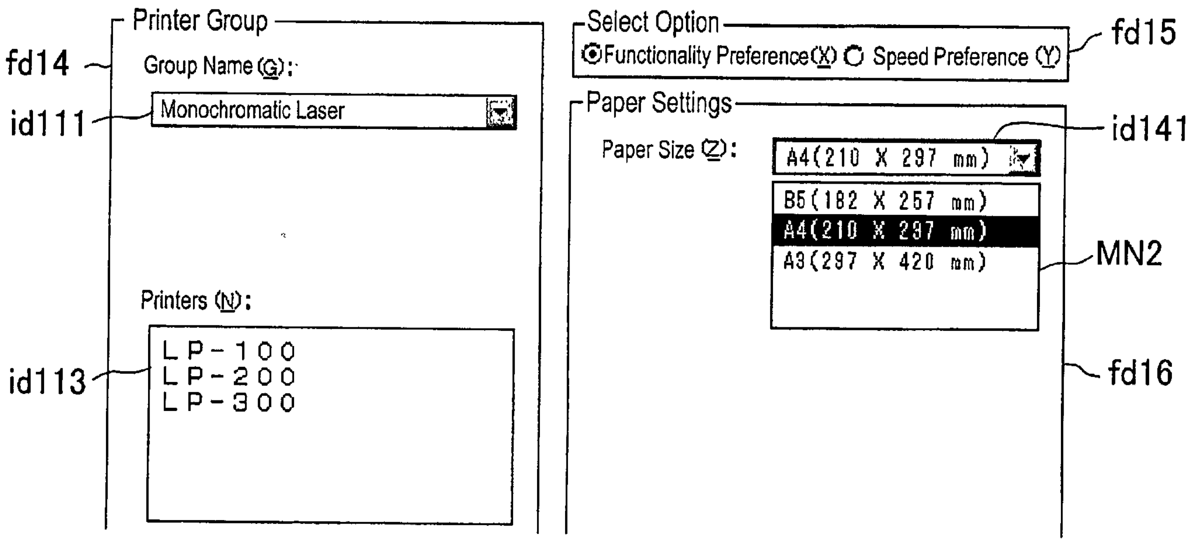
● Functionality Preference (X) ○ Speed Preference (Y)

Paper Settings

Paper Size (Z): A4(210 X 297 mm)

09980111.110301

Fig.32



Printer Group

Group Name (G): Monochromatic Laser

Printers (N):

LP-100
LP-200
LP-300

Select Option

● Functionality Preference(X) ○ Speed Preference (Y)

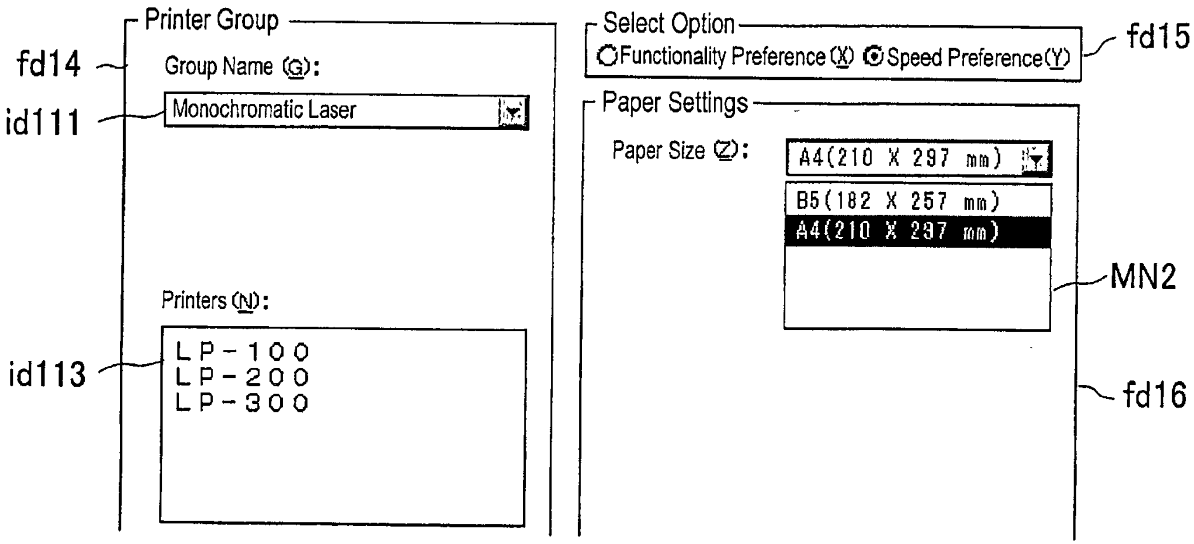
Paper Settings

Paper Size (Z): A4(210 X 297 mm)

B5(182 X 257 mm)
A4(210 X 297 mm)
A3(297 X 420 mm)

fd14
id111
id113
fd15
id141
MN2
fd16

Fig.33



Printer Group

Group Name (G): Monochromatic Laser

Printers (N):
LP-100
LP-200
LP-300

Select Option

○ Functionality Preference (X) ● Speed Preference (Y)

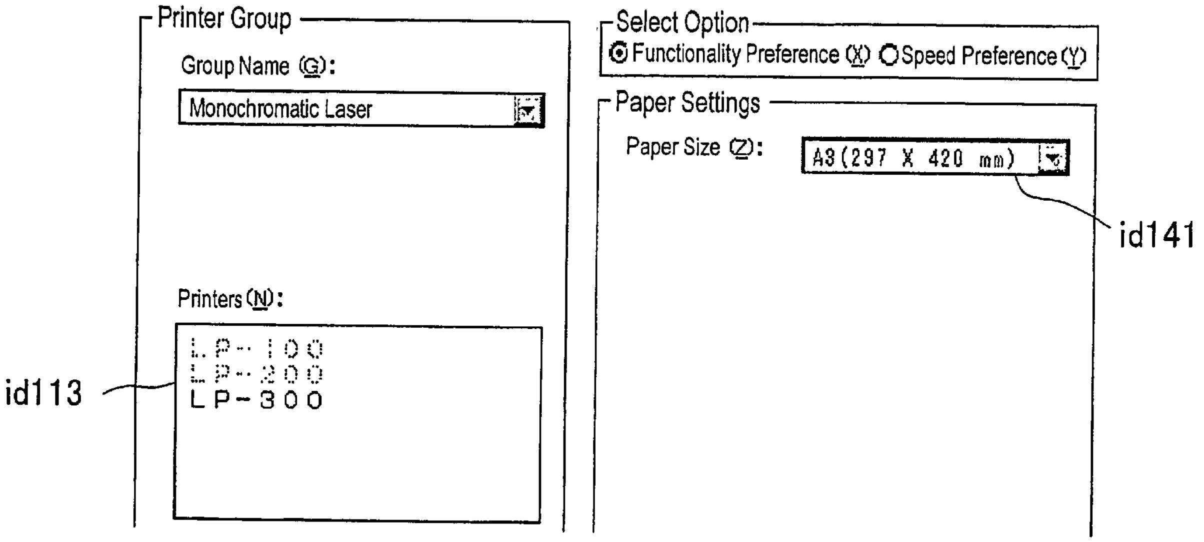
Paper Settings

Paper Size (Z): A4(210 X 297 mm)

B5(182 X 257 mm)
A4(210 X 297 mm)

fd14
id111
id113
fd15
MN2
fd16

Fig.34



Printer Group

Group Name (G): Monochromatic Laser

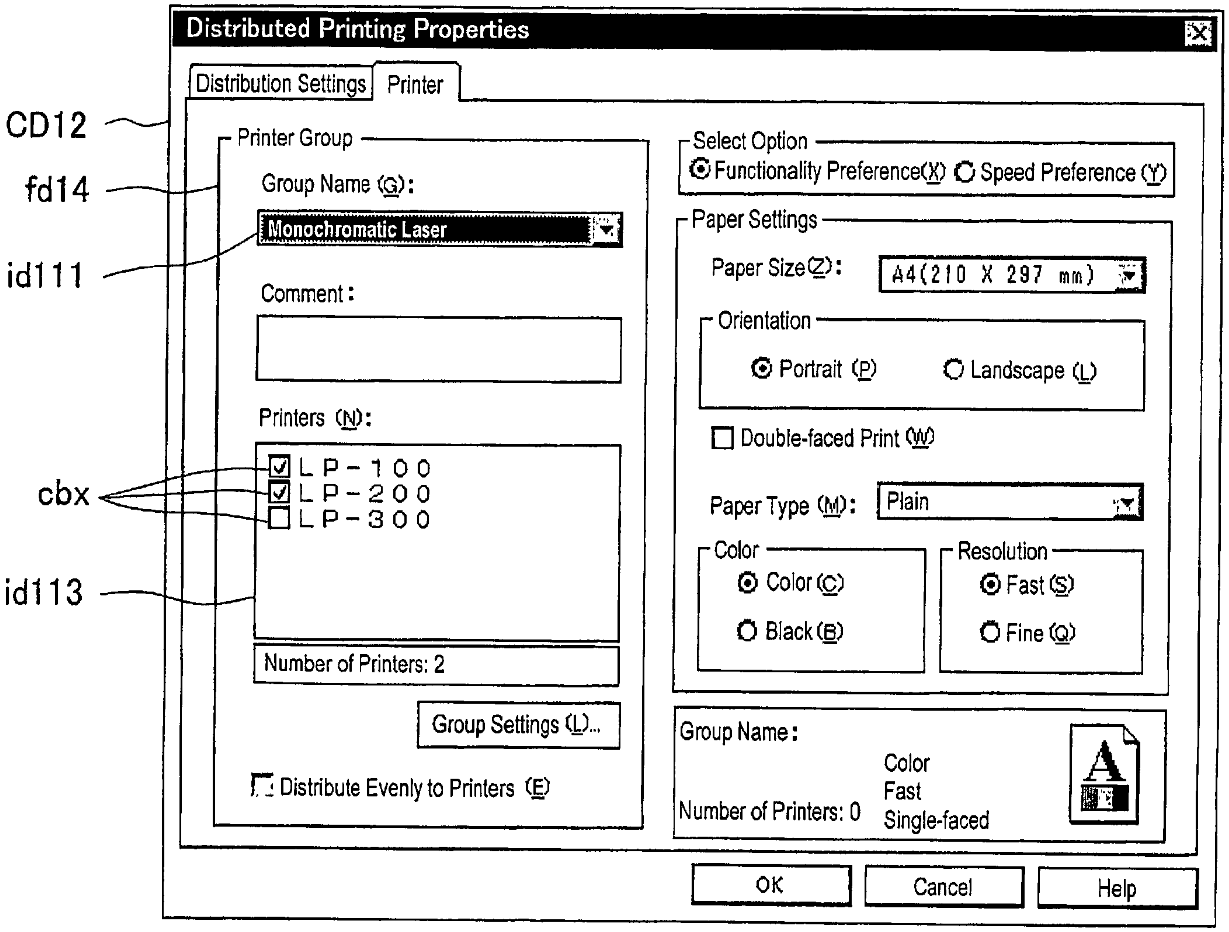
Printers (N):
LP-100
LP-200
LP-300

Select Option
◉ Functionality Preference (X) ○ Speed Preference (Y)

Paper Settings

Paper Size (Z): A3 (297 X 420 mm)

Fig.35



Distributed Printing Properties ☒

Distribution Settings | Printer

Printer Group

Group Name (G): Monochromatic Laser

Comment:

Printers (N):

☑ LP-100
☑ LP-200
☐ LP-300

Number of Printers: 2

Group Settings (L)...

☐ Distribute Evenly to Printers (E)

Select Option

● Functionality Preference(X) ○ Speed Preference (Y)

Paper Settings

Paper Size(Z): A4(210 X 297 mm)

Orientation

● Portrait (P) ○ Landscape (L)

☐ Double-faced Print (W)

Paper Type (M): Plain

Color

● Color (C)
○ Black (B)

Resolution

● Fast (S)
○ Fine (Q)

Group Name:

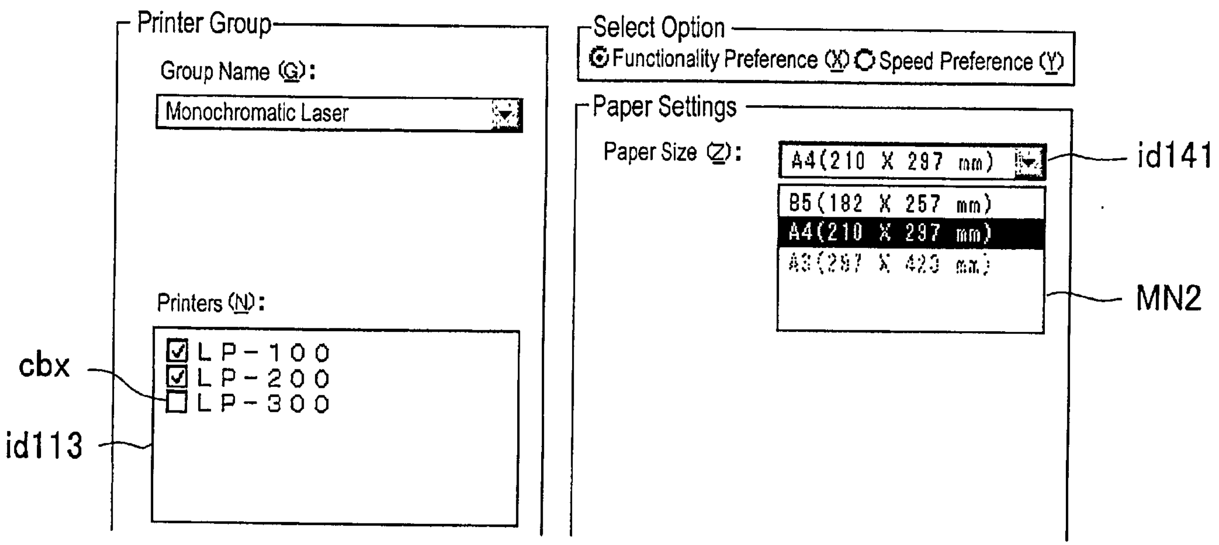
Number of Printers: 0

Color
Fast
Single-faced

OK | Cancel | Help

09980111.113001

Fig.36



Printer Group

Group Name (G): Monochromatic Laser

Printers (N):

☑ LP-100
☑ LP-200
☐ LP-300

Select Option

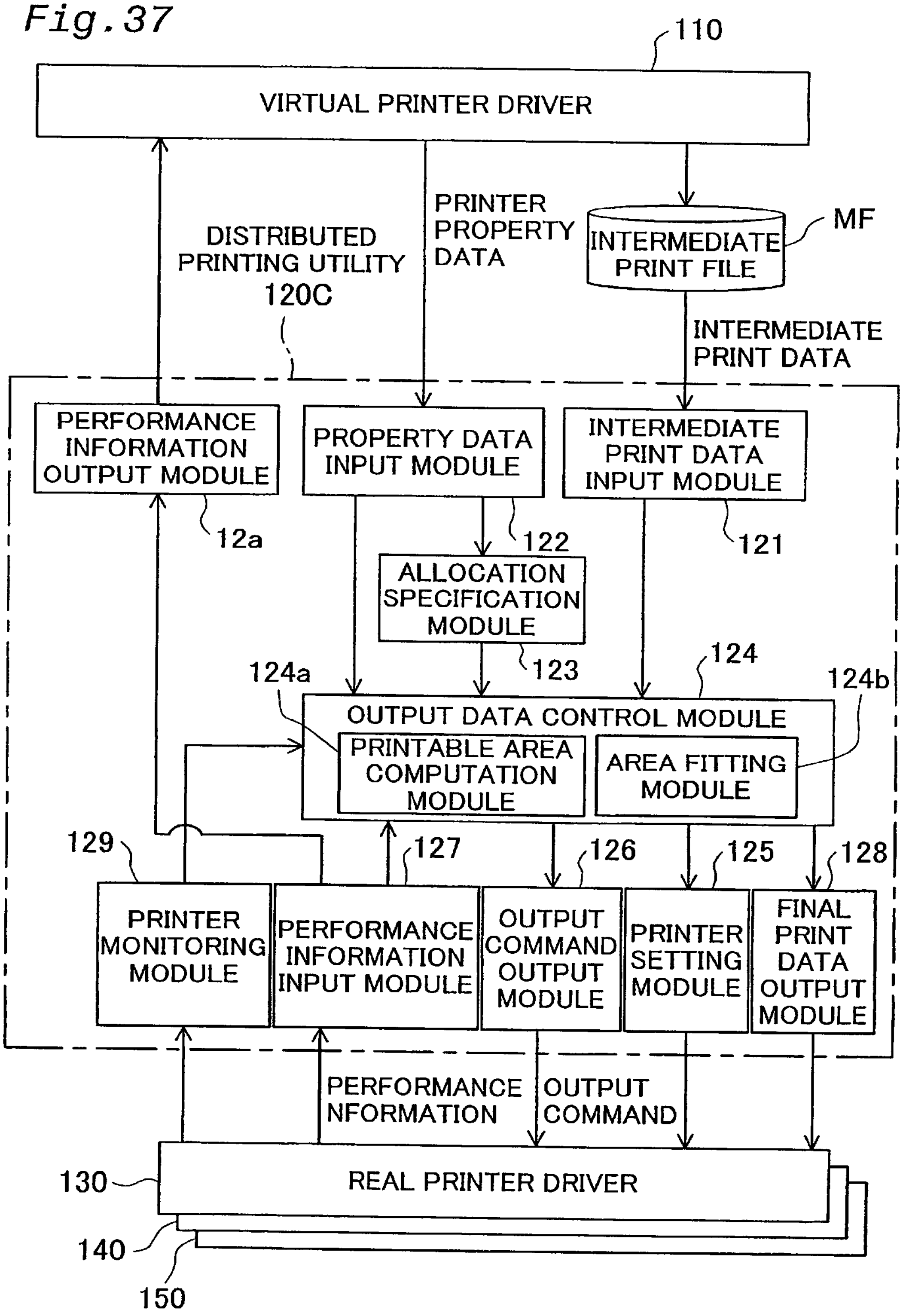
● Functionality Preference (X) ○ Speed Preference (Y)

Paper Settings

Paper Size (Z): A4(210 X 297 mm)

B5(182 X 257 mm)
A4(210 X 297 mm)
A3(297 X 420 mm)

Fig.37


110
VIRTUAL PRINTER DRIVER
DISTRIBUTED PRINTING UTILITY
120C
PRINTER PROPERTY DATA
INTERMEDIATE PRINT FILE
MF
INTERMEDIATE PRINT DATA
PERFORMANCE INFORMATION OUTPUT MODULE
12a
PROPERTY DATA INPUT MODULE
122
INTERMEDIATE PRINT DATA INPUT MODULE
121
ALLOCATION SPECIFICATION MODULE
123
124a
124
124b
OUTPUT DATA CONTROL MODULE
PRINTABLE AREA COMPUTATION MODULE
AREA FITTING MODULE
129
127
126
125
128
PRINTER MONITORING MODULE
PERFORMANCE INFORMATION INPUT MODULE
OUTPUT COMMAND OUTPUT MODULE
PRINTER SETTING MODULE
FINAL PRINT DATA OUTPUT MODULE
PERFORMANCE NFORMATION
OUTPUT COMMAND
130
REAL PRINTER DRIVER
140
150

09960111 .100501

10051101.1199601

Fig.38

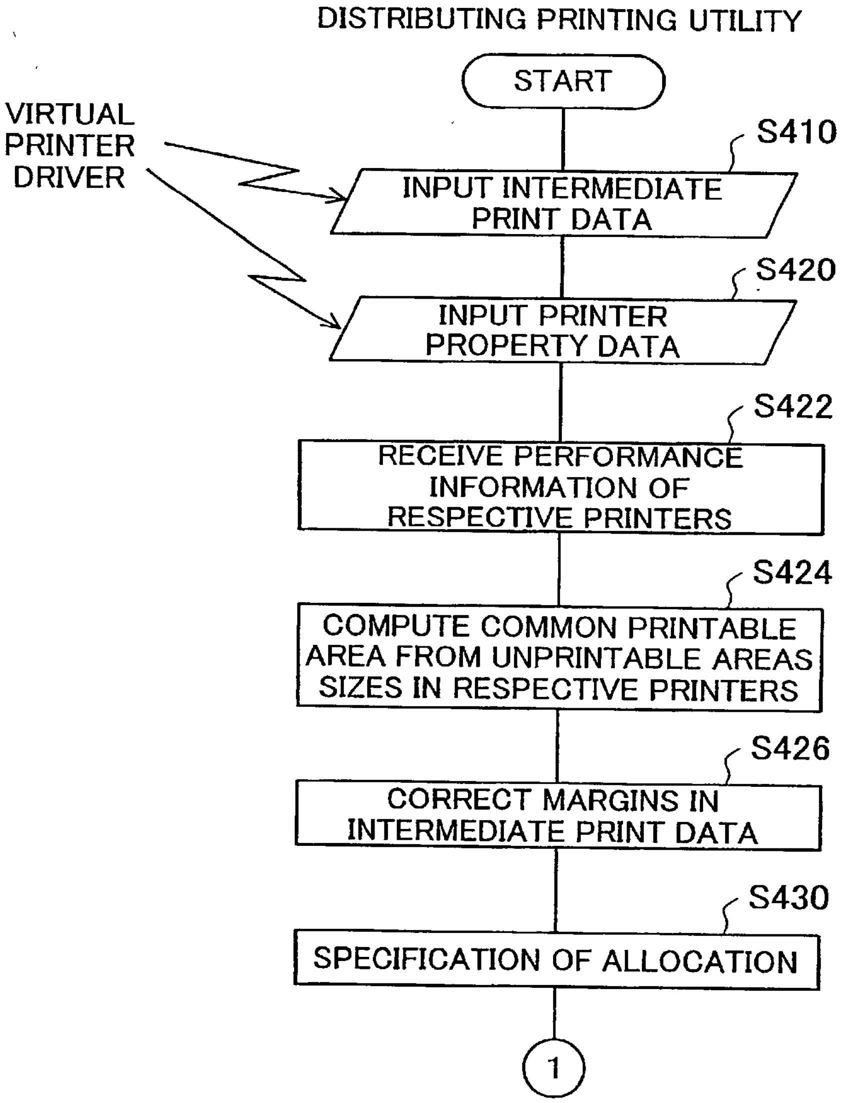
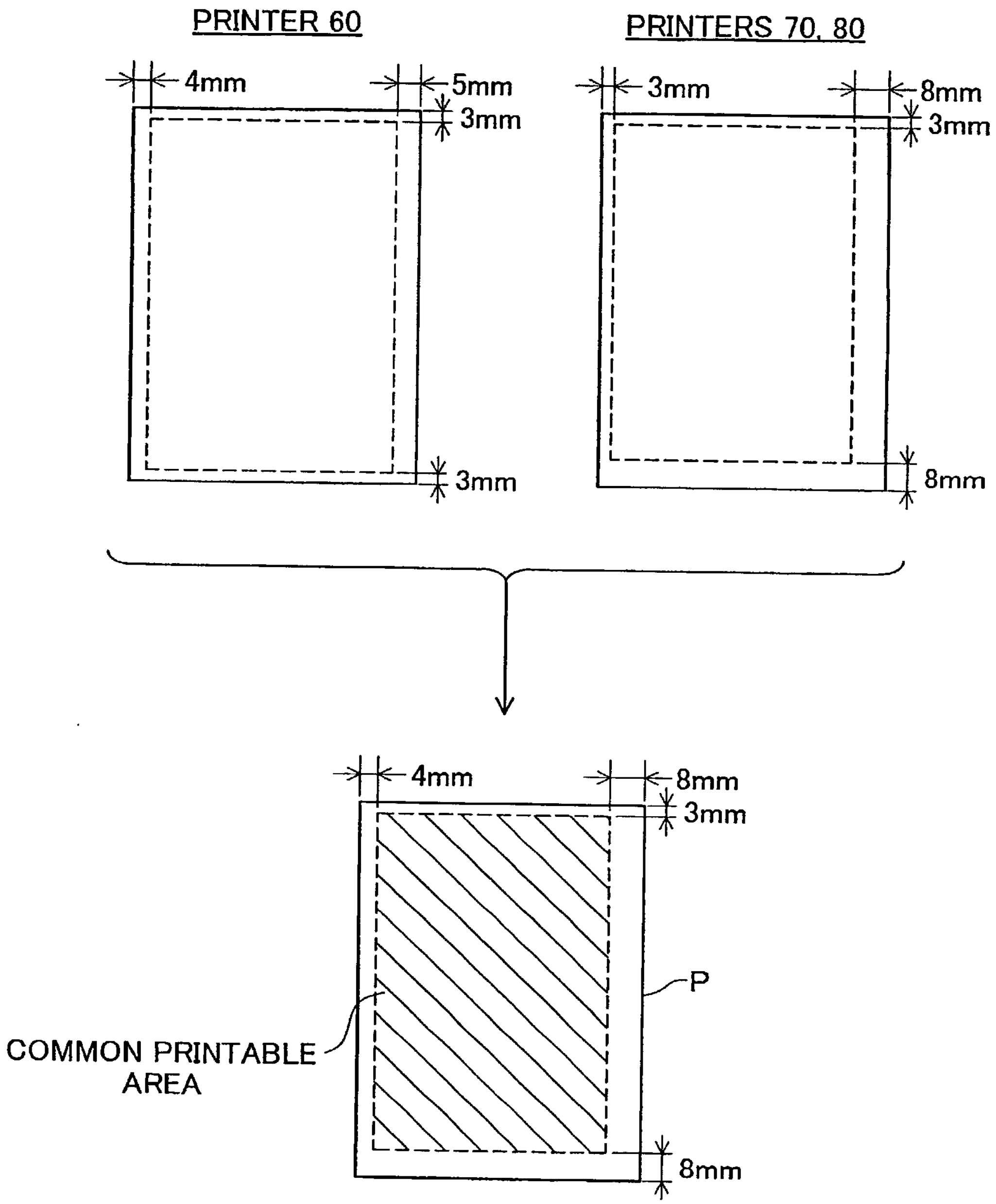

DISTRIBUTING PRINTING UTILITY
START
VIRTUAL PRINTER DRIVER
S410
INPUT INTERMEDIATE PRINT DATA
S420
INPUT PRINTER PROPERTY DATA
S422
RECEIVE PERFORMANCE INFORMATION OF RESPECTIVE PRINTERS
S424
COMPUTE COMMON PRINTABLE AREA FROM UNPRINTABLE AREAS SIZES IN RESPECTIVE PRINTERS
S426
CORRECT MARGINS IN INTERMEDIATE PRINT DATA
S430
SPECIFICATION OF ALLOCATION
1

Fig. 39


PRINTER 60
4mm
5mm
3mm
3mm
PRINTERS 70, 80
3mm
8mm
3mm
8mm
4mm
8mm
3mm
P
COMMON PRINTABLE AREA
8mm

09960111.100301

Fig.40

Output Resources	Page Numbers
Printer 60	1st page、2nd page、3rd page
Printer 70	1st page、2nd page、3rd page
Printer 80	1st page、2nd page、3rd page

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